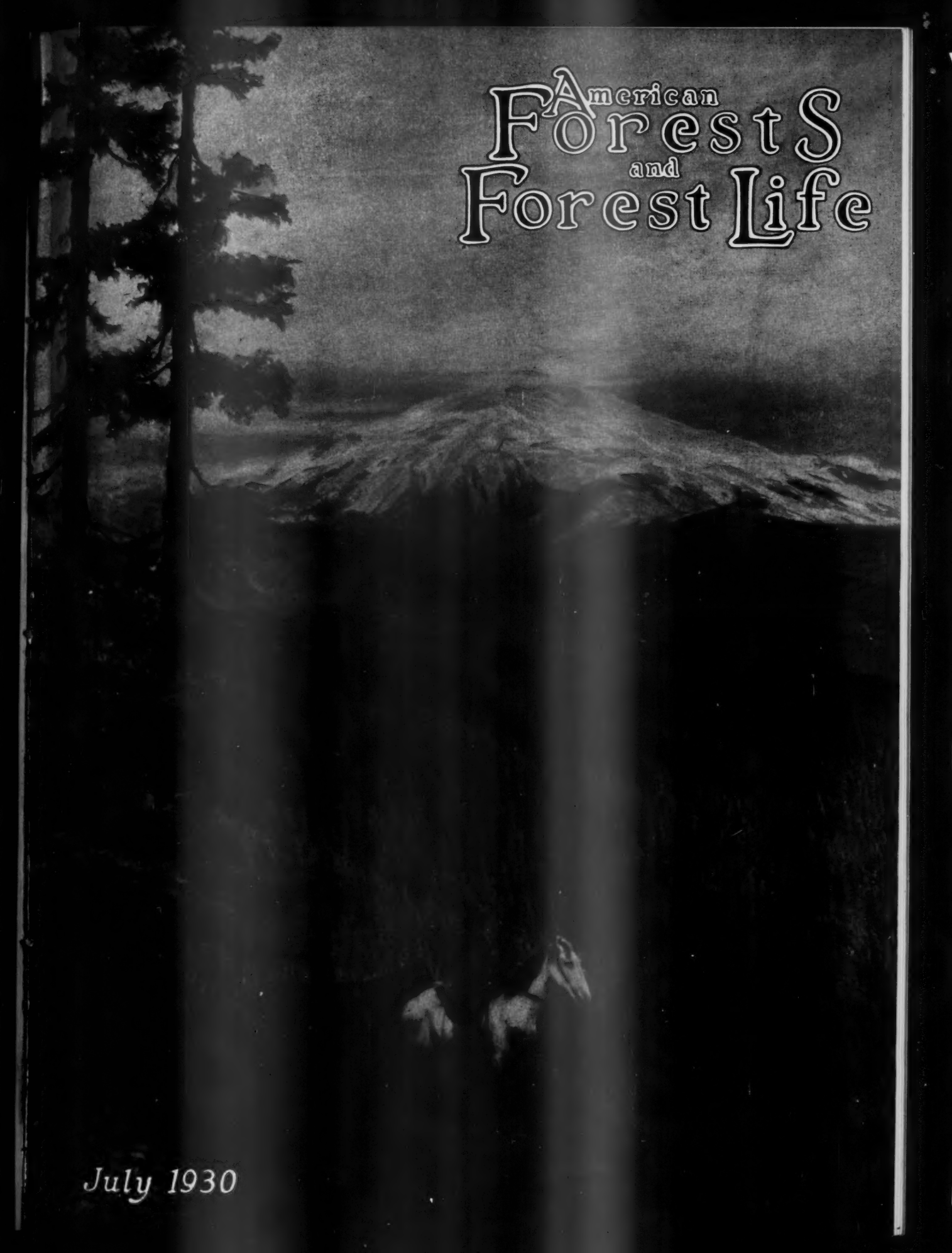

American Forests and Forest Life

July 1930

The American Forestry Association

Washington, D. C.

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ADEQUATE FOREST FIRE PROTECTION by federal, state, and other agencies, individually and in cooperation; the REFORESTATION OF DENUDED LANDS, chiefly valuable for timber production or the protection of stream-flow; more extensive PLANTING OF TREES by individuals, companies, municipalities, states, and the federal government; the ELIMINATION OF WASTE in the manufacture and consumption of lumber and forest products; the advancement of SOUND REMEDIAL FOREST LEGISLATION.

The ESTABLISHMENT OF NATIONAL AND STATE FORESTS where local and national interests show them to be desirable; the CONSERVATIVE MANAGEMENT OF PUBLIC AND PRIVATE FORESTS so that they may best serve the permanent needs of our citizens; the development of COMMUNITY FORESTS.

FOREST RECREATION as a growing need in the social development of the nation; the PROTECTION OF FISH AND GAME and other forms of wild life, under sound game laws; the ESTABLISHMENT OF FEDERAL AND STATE GAME PRESERVES and public shooting grounds; STATE AND NATIONAL PARKS and monuments where needed, to protect and perpetuate forest areas and objects of outstanding value; the conservation of America's WILD FLORA and FAUNA.

The EDUCATION OF THE PUBLIC, especially school children, in respect to our forests and our forest needs; a more aggressive policy of RESEARCH AND EDUCATIONAL EXTENSION in the science of forest production, management, and utilization, by the nation, individual states, and agricultural colleges; reforms in present methods of FOREST TAXATION, to the end that timber may be fairly taxed and the growing of timber crops increased.

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Member A. B. C.

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AMERICAN FORESTS AND FOREST LIFE

OVID BUTLER, *Editor*

L. M. CROMELIN *and* ERLE KAUFFMAN, *Assistant Editors*

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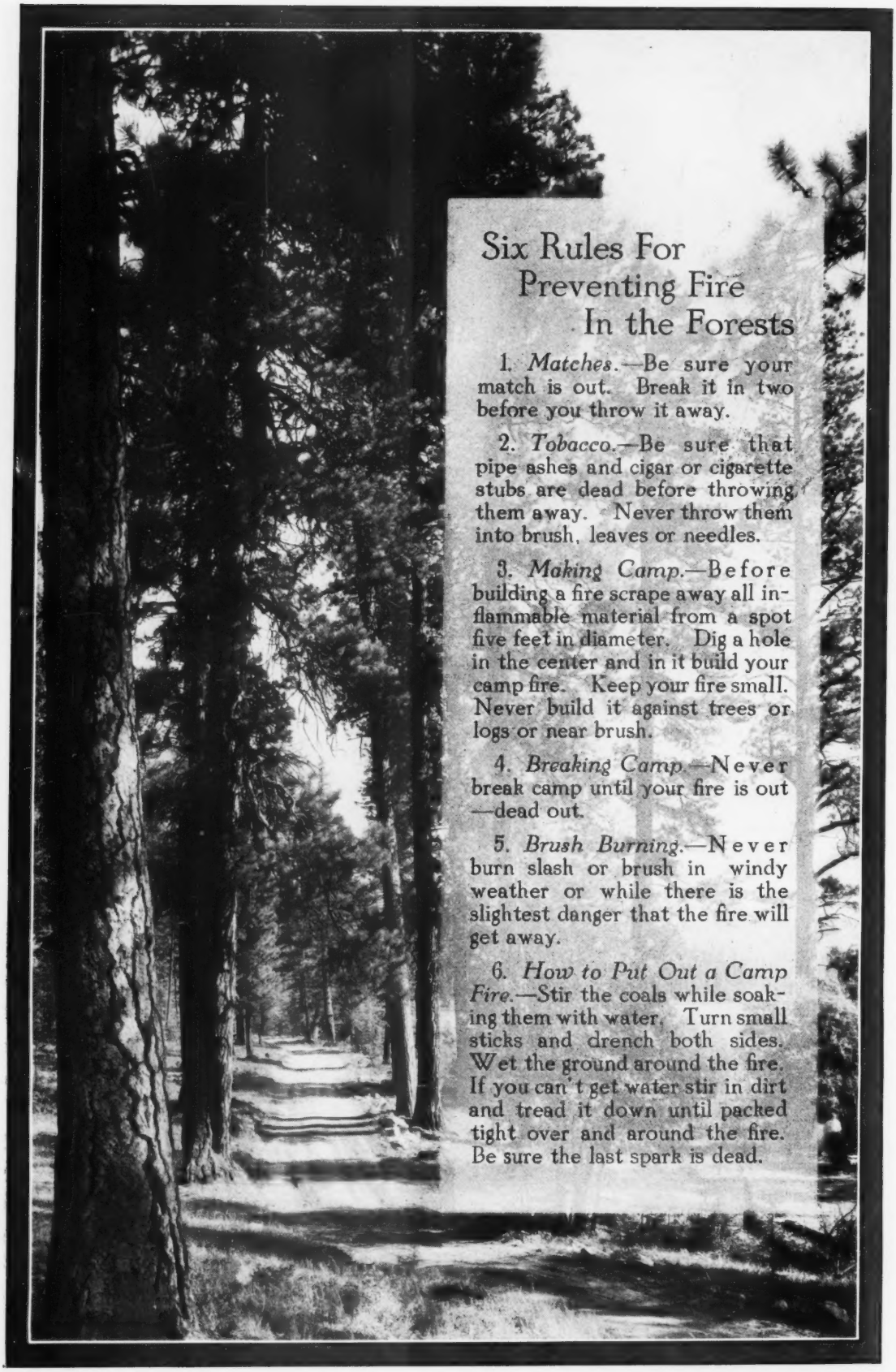


Six Rules For Preventing Fire In the Forests

1. *Matches.*—Be sure your match is out. Break it in two before you throw it away.

2. *Tobacco.*—Be sure that pipe ashes and cigar or cigarette stubs are dead before throwing them away. Never throw them into brush, leaves or needles.

3. *Making Camp.*—Before building a fire scrape away all inflammable material from a spot five feet in diameter. Dig a hole in the center and in it build your camp fire. Keep your fire small. Never build it against trees or logs or near brush.

4. *Breaking Camp.*—Never break camp until your fire is out—dead out.

5. *Brush Burning.*—Never burn slash or brush in windy weather or while there is the slightest danger that the fire will get away.

6. *How to Put Out a Camp Fire.*—Stir the coals while soaking them with water. Turn small sticks and drench both sides. Wet the ground around the fire. If you can't get water stir in dirt and tread it down until packed tight over and around the fire. Be sure the last spark is dead.

Sunrise on Sunrise Lake, as seen from Mount Baker Lodge
on the Mount Baker National Forest

Your National Forests

By Arthur M. Hyde
Secretary of Agriculture

IN THE present century man has found wings and begun to mount into the air. Much longer ago he learned to plow the seas in ships. Nevertheless, the human race is still a race of land animals. Its abode is on the earth, its sustenance drawn chiefly from the soil. What we do on, with, and to the surface of the ground makes up the main story of human progress. The resources that lie stored beneath the surface and the teeming life of lake and ocean are drawn upon as means to better living in man's true habitat, on the bosom of fruitful mother earth.

But mother earth disciplines as well as nourishes. Painful lessons must be learned, hard problems solved. Fruitfulness can be destroyed. The stronger man becomes, the greater his power to abuse the land, and the graver the consequences if he does. The practice of conservation—which means not abstention from use, but use with an eye to consequences—is fundamental to national prosperity. Indeed, it may easily prove the determining factor for national existence.

By a fortunate accident of place and time, the making of National Forests began in the western half of the United States. Had the civilization of the American continent started from the Pacific side—had the lie of the continent and of all its physical conditions been reversed, so to speak, bringing California and the littoral northward from it nearest Europe—there is no telling what irremediable destruction might have been wrought before the United States came to the stage of development that made possible effective forest conservation. The forests of the West are both highly susceptible to fire and essential to the maintenance of a healthy regional economic life. They are made up almost entirely of coniferous species; they cover principally the great mountain ranges; they feed the streams that water the dry country; they are exposed to severe summer drouth. Had they been blotted out, as they must largely have been if the march of settlement started from the territory now included in our western states, consequences not unlike those that have been

brought about in Spain through deforestation would have enfeebled not merely the West, but the rest of the country too. For we are all in the same boat. An unprosperous West would cripple the East.

A few weeks ago I received a number of petitions from various organizations interested in apple-growing in a small valley of central Washington, east of the Cascade Mountains. Agricultural development is there impossible without irrigation. The water for irrigation comes from the mountain slopes. A chain of National Forests, continuous save for the narrow break where the mighty Columbia River cuts through the towering mountain uplift, stretches from the Canadian line to southern Oregon. These forests conserve the waterflow from both flanks of the two ranges. The particular forest affecting the interests of our petitioners is the Wenatchee.

Wenatchee is a name familiar throughout the East, but not as the name of a National Forest. It has been made deservedly famous by fine, red apples, which come annually in thousands upon the eastern markets. The Wenatchee apple orchards flourish and bear their fruit where formerly flourished chiefly sagebrush, and where nothing more valuable than sagebrush and other sparse desert vegetation could grow were it not for the water diverted by the enterprising apple growers from the Wenatchee River or its tributaries and placed upon the valley and bench land.

But the Wenatchee petitioners had become anxious. The irrigated lands in this single valley have an estimated value of $25,000,000. The population directly and indirectly supported by this agricultural activity numbers 34,000. The whole economic structure rests on water. As the orchards grew they called for more water. But the volume of water that runs down the mountain flanks and gathers into local streams has given signs of shrinking. The apple-growers had become pretty well convinced that sheep-grazing in the mountains was to blame. They were suspicious, too, regarding the consequences of timber-cutting on the National Forest watersheds—"their" watersheds, in the sense that they were the watersheds upon which the whole valley community was absolutely dependent for its continued existence. They thought their interests should be recognized as paramount.

Other interests, however, were also dependent upon continued use of these lands. Ranch properties in that region are valueless for livestock production without mountain pasturage to carry the stock through the summer months. The livestock business involved represented an investment of $1,500,000, resting on continued use of the range within the Wenatchee National Forest and the Wenatchee watershed.

In essence, the administrative problem raised through the petitions of the Wenatchee water users was in no way different from that confronting the Forest Service day by day and year after year, almost throughout the length and breadth of the 160,000,000 acres of National Forests, in all parts of the country. A fairly simple working principle is applied. The end sought is to obtain from the land the largest net total of public benefits. Everybody affected is to be considered. The first question to be answered is—What is the highest form of use of this land, not in the interest of the government as landowner but in the interest of the nation, for which the government is acting in the capacity of trustee? The second question is—How much more of public usefulness can be given this land by providing also for various other forms of use that can go on simultaneously if all are fitted together in the right pattern? This process of adjustment and coordination involves weighing other than money values, and indirect as well as direct benefits. Service of the public welfare is made the watchword—that, and that only.

While the ways in which the National Forests are made to contribute to the public welfare are legion, the main lines of correlation concern water, timber, range, and recreation. These are the four great resources administered. All were involved on the Wenatchee. Obviously, had not the National Forest been in existence the water users would have been without recourse. The Wenatchee River drainage basin covers about 600,000 acres. Its value for timber and grazing would have led to its acquisition for private purposes long ago, had it been open to acquisition under the general land laws; each owner, once in possession, would have pursued the course dictated by his own interest; and to buy them all out in order to prevent practices injurious to waterflow, and after buying the watershed, to protect it against fire, would have imposed on the valley dwellers an impossible burden. But federal ownership for public forest purposes gave them their day in court.

But why should they have to come into court? Why should the head of a federal department at the seat of government in Washington have to be appealed to, in a matter so local? The general theory of most public-land legislation has been to pass the Public Domain into the possession of those best qualified to put it to beneficial use, for the particular purpose to which it is best adapted. If the highest use of the Wenatchee watershed is to enable sagebrush land to grow red apples for the American people to eat, why not make the watershed over to the apple-growers? Let them protect it, collect grazing rentals and sell the timber if and where they want to, under such stipulations as they wish to make for the protection of their water supply, and thus be rid of the cost to the nation of administering these lands for the sake of local benefits. Why not have community responsibility for and management of community affairs?

At the time that the residents of the Wenatchee Valley were getting up their petitions, I think possibly the proposal of such a way out might have struck them favorably. But they have since learned some things that they did not then understand. They have learned, for one thing, that national administration of the forest-covered mountain lands can be accompanied by full consideration for local interests and prompt responsiveness to local sentiment. They have learned also that other interests than their own are concerned. And they have learned that public forest and watershed management is a pretty complex thing, calling for men who know their job thoroughly and having back of it a strong, specialized organization such as the federal government maintains.

The method pursued by the Department of Agriculture to give the petitioners opportunity to present their case in full

was not the method of a distant, unresponsive, dictatorial authority. A day was set for a public hearing before a representative of the Department sent from Washington to conduct it at the local county seat. All parties in interest and all persons having information on the questions involved were invited to appear. Notice of the hearing was given wide publicity locally. The actual conditions on the watershed, and the reasons for them, were fully brought out. The whole discussion was without acrimony. What really happened was that the whole local community, through representative and qualified leaders, met in earnest council with public officials sympathetically seeking with them to discover what might be done to make the local National Forest enterprise more serviceable to the community.

It soon appeared that the agitation for closing the watershed to all use by livestock was due largely to misinformation as to the actual conditions. Weather Bureau rainfall records, when correlated with other evidence and the observed facts of stream behavior, made it clear that such decrease in the water supply as had taken place was the result not of grazing but of a cycle of dry years which had affected the entire region. On the other hand, it was also shown that in places the range was being overgrazed and the number of stock admitted should be curtailed. The stockmen on their part were brought to see that certain features of their methods gave rise to complaints which a spirit of good neighborliness should lead them voluntarily to eliminate. The water-users saw that in many particulars they had been wrong, and that they should themselves assume more responsibility for maintaining conditions favorable to their interest in the forest.

Small matters sometimes have large significance. What happens on or to the watershed of a minor tributary of the Columbia River, in central Washington, may seem of very slight concern to the people of the United States as a whole.

Majestic forests clothe with green the far-flung splendor of the mountains on the Columbia National Forest, in Washington

And so it would be, if nothing further were involved. But multiply the area 300 times, and the practices of land use have an important bearing on the welfare of the nation.

The western National Forests stretch from Canada to Mexico. Their waters flow to the sea through the Columbia, Colorado, Rio Grande, Missouri, and many other streams. Their ranges provide pasturage each year for close to 8,000,000 livestock grazing under permit, and for millions more of young lambs and calves. Their timber approximates one-fifth of the total stand in the country. Their tourist visitors and recreation seekers last year numbered more than 31,000,000 people. While the direct benefits derived from use of their resources are largely local, the way they are used, considered as a whole, integrally affects the welfare not only of the whole West but also of the states whose forest problems are of a very different kind.

"T. R." -- Trailblazer

Reminiscences of Our National Forest President

Theodore Roosevelt, the inimitable "T. R.," has often been called the National Forest President—and rightfully so. Perhaps few men in public life ever enjoyed such an intimate knowledge of the natural resources of the nation, few were so inspired and none did more to safeguard them. In *Theodore Roosevelt—An Autobiography*, published in 1913, the President who preached and practiced "soft words and a big stick" reviews the trailblazing days of the National Forests, excerpts of which are printed in this article by special permission of the publishers, Charles Scribner's Sons.

To lead his forces in the fight to win the nation to forestry, President Roosevelt selected Gifford Pinchot. Of him, in his autobiography, the President wrote:

". . . Gifford Pinchot is the man to whom the nation owes most for what has been accomplished as regards the preservation of the natural resources of our country. He led, and indeed during its most vital period embodied, the fight for the preservation through use of our forests. He played one of the leading parts in the effort to make the National Government the chief instrument in developing the irrigation of the arid West. He was the foremost leader in the great struggle to coordinate all our social and governmental forces in the effort to secure the adoption of a rational and farseeing policy for securing the conservation of all our national resources. . . . Taking into account the varied nature of the work he did, its vital importance to the nation and the fact that as regards much of it he was practically breaking new ground, and taking into account also his tireless energy and activity, his fearlessness, his complete disinterestedness, his single-minded devotion to the interests of the plain people, and his extraordinary efficiency, I believe it is but just to say that among the many, many public officials who under my administration rendered literally invaluable service to the people of the United States, he on the whole, stood first."—*Editor.*

"WHEN Governor of New York I had been in consultation with Gifford Pinchot and F. H. Newell, and had shaped my recommendations about forestry largely in accordance with their suggestions. Like other men who had thought about the national future at all, I had been growing more and more concerned over the destruction of the forests. . . .

"The first work I took up when I became President was the work of reclamation. Immediately after I had come to Washington, after the assassination of President McKinley, while staying at the house of my sister, Mrs. Cowles, before going into the White House, Newell and Pinchot called upon me and laid before me their plans for national irrigation of the arid lands of the West, and for the consolidation of the forest work of the Government in the Bureau of Forestry. At that time a narrowly legalistic point of view toward natural resources obtained in the departments, and controlled the govenmental administative machinery. Through the General Land Office and other government bureaus, the public resources were being handled and disposed of in accordance with the small considerations of petty legal formalities, instead of for the large purposes of constructive development, and the habit of deciding, whenever possible, in favor of private interests against the public welfare was firmly fixed. . . .

"The idea that our natural resources were inexhaustible still obtained, and there was as yet no real knowledge of their extent and condition. The relation of the conservation of natural resources to the problems of national welfare and national efficiency had not yet dawned on the public mind. The reclamation of arid public lands in the West was still a matter for private enterprise alone; and our magnificent river system, with its superb possibilities for public usefulness, was dealt with by the National Government not as a unit, but as a disconnected series of pork-barrel problems, whose only real interest was in their effect on the reëlection or defeat of a Congressman here and there—a theory which, I regret to say, still obtains. . . .

"All the forests which belonged to the United States were held and administered in one department, and all the foresters in Government employ were in another department. Forests and foresters had nothing whatever to do with each other. The National Forests in the West (then called Forest Reserves) were wholly inadequate in area to meet the purposes for which they were created, while the need for forest protection in the East had not yet begun to enter the public mind.

"Such was the condition of things when Newell and Pinchot called on me. I was a warm believer in reclamation and in forestry, and, after listening to my guests, I asked them to prepare material on the subject for me to use in my first message to Congress, of December 3, 1901. This message laid the foundations for the de- (*Continuing on page* 464)

The Shield and the Tree

Origin of the Emblem Which Has Been the Symbol of the Forest Service for Twenty-Five Years

IDENTIFIED with the Forest Service for twenty-five years as its printed emblem, its property-mark, the flag of its fleet, and, above all, as the service symbol and badge of authority worn by every officer, is the device of the shield-enclosed tree. Its history is less known, even by the thousands of wearers to whom it signifies so much and whose highest loyalty and effort it inspires. Like most official emblems of organized peoples, it represents forgotten origins in antiquity, preservation by heraldic usage, development of new symbolism, and accidents of whimsicality and circumstance. Savages used shields, usually circular, almost as soon as they did weapons. Organized fighting men of early Europe developed an elongated form, squared at the top for vision and pointed at the bottom to fix in the ground to withstand shock. Short or long, this shape was contemporary with heraldic art to make the shield carry the leaders' coat-of-arms and identify their forces in battle, transit, or lodging. As the mounted knight became a conspicuous figure, the right side of the shield had to be cut away to facilitate use of his heavy lance. To maintain symmetry for heraldic device, the left side had to be similarly indented. So came down to us one of the most popular designs by which the shield is now used either as a symbol of public defense, as the badge of law enforcement officers, or merely as an ornament. When in 1905 the newly named Forest Service desired to supplant the circular nickeled badge that previously showed the authority of forest reserve officers, a designing contest was instituted at Washington, D. C. Gifford Pinchot, then Chief Forester, Overton W. Price and E. T. Allen comprised the judging committee and no rules of design were imposed.

The result was an interesting collection, some ingenious and artistic—scrolls, tree leaves and maple seeds—but there was much disregard of recognizable authority to enforce law or regulations. Not a single design satisfactorily combined essentials. So a new start, with specified requirements, was necessary. As a suggestion along this line, Allen, who as one of the judges was insistent upon a conventionalized shield of some kind to assure quick public recognition of authority and also suggest public defense as a forestry object, was tracing the Union Pacific Railroad shield emblem from a time folder which lay on his desk and inserted the letters "U. S." conspicuously. W. C. Hodge, now dead, who was watching him, suddenly sketched a conventional coniferous tree on a cigarette paper and laid it between the two letters to complete the symbolism. Another minute and "Forest Service" was written above and "U. S. Department of Agriculture" below. This three-minute combination of a railway folder and a cigarette paper satisfied all three judges so the contest was called off. And so appropriate utilization of centuries of groping and experience accomplished a purpose.

An outstanding figure of the early days, J. C. Wells, who, as a ranger on the Mono National Forest, in California, was the original of the character "Ranger Bill"—so familiar in Service annals

Lest We Forget!

A Tribute to the National Forest Pathfinders

By E. T. ALLEN

GENUINE old-timers, although appreciative of remarkable developments, are mildly resentful when the National Forest era is dated from 1905—when the Forest Reserves were transferred to the renamed Forest Service. To them, whether or not their memories are of official and proprietary connection, much earlier days seem quite as significant and considerably more colorful.

They were frontier days. Turbulent miners and stockmen had not been tamed by unseen powers in Washington, the control of the automobiling tenderfoot was not an important problem. The project was by no means established, but regarded much as an eastern imposition on western development. Its political aspect aroused violent conflict. The contacts of forest officers with forest users easily became contests. The reduction of this situation to the comparative order prevailing in 1905, when such a foundation enabled specialists to proceed with structural detail, was perhaps the most picturesque chapter of American forest history.

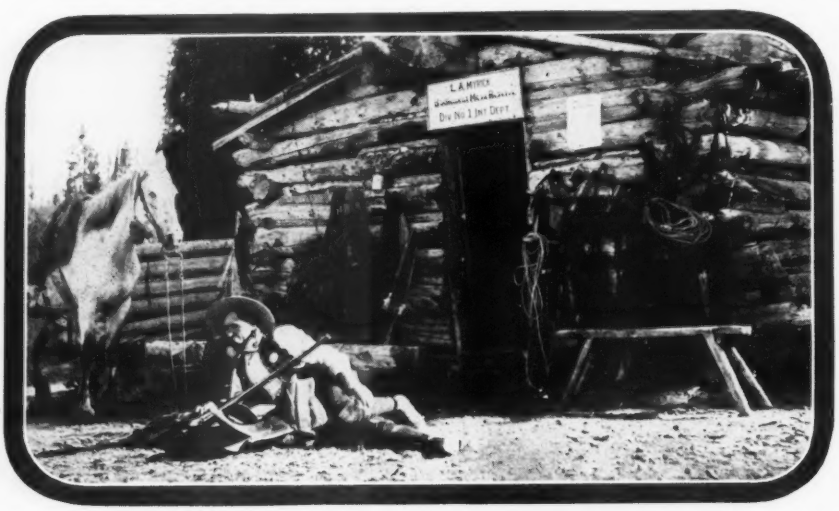
To describe the origin of National Forest administration, however, would require going back even before the sundry civil appropriation act of July 1, 1898, carried $75,000 for an actual start of the work. This act financed the beginning of a system otherwise provided for by the fundamental 1897 administrative law, which in turn belatedly recognized the necessity created by large presidential withdrawals of lands under the historic 1891 law, which first authorized the Forest Reserve policy. But this also was hardly more than a successful development of similar proposals earlier. Senator Plumb's unsuccessful bill in 1878 was a comprehensive measure for creating and administering National Forests. It followed a less specific bill introduced in 1876.

Therefore many considerations and many compromises were unavoidably inherited when finally, due chiefly to the genius and persistence of the country's great pioneer forester, Bernhard Fernow, a real policy of National Forest reservation was established by the 1891 and 1897 laws and given to the

Interior Department in 1898 to administer with pitiful funds. From then on no time was lost in making the colorful history of the National Forests themselves.

Field administration in the beginning lay chiefly with state superintendents, the authority, or even appointment, of supervisors for separate Reserves being a later development. When the writer first served as a ranger, in 1898, he was appointed, directed and paid by a state superintendent. These superintendents, also the earlier supervisors, were politically appointed, largely upon nomination by United States senators. At that time there existed nowhere, in any Government department or in private life, a source of men technically and administratively trained to combine the varied and difficult requirements of forest management under conditions confronted. Indeed, nobody in either public or private life knew just what the job would entail and therefore what type to select as most promising. A few of the appointees were conspicuously unfit. On the whole they averaged as do postmasters, ambassadors and Cabinet officers politically appointed—not originally trained for the job, but honest and sincere.

Directly above this field authority was a division of the General Land Office, undermanned and new to the work, feeling a responsibility for controlling detail that was greater than its experience. Below was the ranger force, mostly sincerely selected by superintendents and supervisors for the best efficiency $50 a month could hire, but containing a few black sheep with and without political pull. Like their immediate superiors, they had little or no experience in representing Uncle Sam and found it hard, in the contests into which they were plunged, to know whether he expected firmness or leniency. Anyway he seemed very distant when some delegate to Congress vigorously supported their adversaries. At that time, however, no other system could have been devised easily. It existed under Congress and Congress had not then, as it has since, accepted the National Forest project, with its western members anxious to strengthen its protective functions in their states. And such a system, in trying to find its feet, naturally disclosed in its several levels of rank some men of conspicuous incapacity, a majority of average ability, and a very conspicuous leaven of men of high ability and courage, attracted and developed by its adventurous and patriotic service.



The "office" of a Forest Ranger in the colorful and picturesque "pre-Forest Service" days

Most interesting, of course, especially in comparison with the present system which has taken thirty-two years to build—long enough for men to be born and matured in its tradition—are the crudities of the early days. We all enjoy the stock story, probably untrue, that one of the first constructive steps was to send each ranger a rake, with instructions to clean up the forest floor of his district. At that, it wasn't more extreme than alleged instructions to marcel brush piles that a recent timber purchaser solemnly complains of. But many of the good stories told on and by the pioneer rangers are as true as they are unbelievable. In 1898 I carried a heavy pack for two days, not only off my beat but above timber line, for a prominent eastern scientist who was teaching his family mountain-climbing. I was told that I would be fired if I did not do it. I wasn't sure he could, but took no chances. When I was hired as a ranger and asked for instructions, my superior succinctly said "go and range," and when I asked where, he said, "you know better than I do—you claim to be a woodsman and I don't." When I wanted my pay in the fall he had just discovered that a daily report of my summer work was essential and I had then and there to invent an imaginative report process that undoubtedly contributed a great deal to Uncle Sam's satisfaction that his forest rangers earned $50 a month.

There was the ranger in New Mexico who came from the *effete* East through political pull and a desire to see the great open spaces. He committed the antisocial indiscretion of telling one cow outfit he had seen another cow outfit branding its calves. This caused his bootheels to be shot off in a saloon and, to vary his dancing step, his being roped and jerked up and down a high gate post. Told he must kill somebody to restore his authority in the community, he said this was another western crudity, the subtler eastern revenge being to cheat his enemies in a poker game. One thing led to another, as one might say, and when, having then attained the position of trouble-shooting inspector for the Secretary of the Interior, I was commissioned to "inspect" his official conduct, I never found him at all. His friends, of which his intrepidity had won him

many, kept him hid out in resentment of bureaucratic interest in an official's private life.

Then there was the supervisor who used to hire his rangers' horses, collect a fat expense account therefor, and not pay them. Unpopularity for this, for making forest users attend dances and pay him for playing the cornet as sole music, and for similar semiofficial industry, led him to be transferred to another reserve and to his successor being warned to stay off the reserve entirely. Still another supervisor I "inspected" charged me with pernicious political activity because I wanted him to keep his office open six days a week when, being a doctor, obviously he couldn't desert his practice but one day a week.

A supervisor, back in 1901 on the Cleveland National Forest, in California, instructing one of his rangers

Sometimes the bewildered rangers' reactions took one form and sometimes they took another. One was to supply an inspector with a man-killing horse and, if he survived, to ride him down by relaying each other. But once I was entertained by a thoughtfully collected group whose spokesman gracefully expressed their appreciation of the visit and opportunity to get information. So I asked what they wanted to know most. He said the last brass-collar visitor spent his entire time telling them how to work a fire down to a point, then had to catch a train. What they had been worrying about ever since was what to do with that point when they had it.

Forest officers of thirty years ago hadn't been to forest schools. They didn't know much about silviculture. They didn't wear uniforms. Perhaps they hadn't much *esprit de corps*. Some were incompetent, as perhaps some are now. But they were picturesque and most of them worked hard on the job. They had no automobiles and few trails or telephones; there were no government-built stations and pastures. They got small pay. But they could take care of themselves and their horses. As a rule they had community respect as men, which went a long way toward substituting for any official prestige. They established a tradition that made things easier for their successors. The amusing incidents I have related were exceptions.

Meanwhile, throughout the groping six years from 1898 to 1905, certainly the hardest fifth of the National Forest system's thirty-two years of still-progressing organization, there was accelerating advance from chaos toward order. It lacked the drive that came later with increased public and administrative support, but was the more creditable to the men who worked without such support. To Filibert Roth, who took charge of the division in the General Land Office at the beginning of 1902, is mainly due the organization of forces, duties and methods into a comprehensible, concrete system, little changed today in fundamental principle although tremendously expanded and refined. He encountered opposition and finally resigned, but the difficulties he met never again reached a stature to threaten seriously the system and high purpose he bequeathed. Bequeathed also, when the Reserves were transferred in 1905, was much that was best in spirit and tradition of the old West, without which the differently enviroined Forest Service would have been greatly embarrassed in dealing with the people and problems of its new empire. The way was opened largely by the loyalty and intelligence of tried local officers, as a rule already imbued with the spirit of serving the forests above all else, exercised with the self-reliance and courage of frontier tradition.

It is essential for the fullest value of the western forests, and this for all time, that whatever may be the economic and scientific developments, the spirit of the old West shall not wholly die. The men who rode the forest ranges thirty years ago, whether on Government business or on unfortunately contrary business, were largely alike in typifying that spirit of adventure, hardihood and love of a wild land. They were impatient of convention because they survived by meeting emergencies alone and unaided. Hope and confidence rarely failed them. Their work had little of present-day technique. It was chiefly to do the best they could, without these aids, to protect the forests against fire and man. But who shall say they were without vision? "See these seedlings coming up?" said Old Man Hooper, a grizzled ranger, as we rode one hot day across a burn in the Colorado Rockies. "Twenty years from now I'll be riding through here in the shade." Hooper is dead now, but his spirit does ride there in the shade. With that of his comrades on other forest paths of old, it has given much to those who carry on and those who will hereafter.

THE FIRST RANGER STATION

Thirty-one Years Ago in Montana's Forest Wilderness Two Hardy Rangers Raised Old Glory Over Alta Cabin

By JOHN W. LOWELL

RAIN! Rain! Rain!

It had been pouring for three days and nights without intermission when H. C. (Hank) Tuttle, recently appointed forest ranger, drew up with his saddle horse and pack mule under the protecting branches of a large western yellow pine tree at what is now the site of Alta, Montana, on the West Fork of the Bitterroot River in Ravalli County. There were no buildings on the West Fork at that time save a single prospector's cabin.

Hank slid from his horse, dropped the bridle reins and sought the shelter of the huge pine.

"Well, this is the place I was ordered to meet Wilkerson, that new ranger," he soliloquized. "I suppose he is lost or bogged down on his way over the divide. A fine idea to send us two out here fifty miles from nowhere with no instructions except to patrol the Bitterroot Forest Reserve, watch out for timber trespass and put out fires. A fine chance we would have of stopping any fire with an ax and a shovel if it ever gets dry. Why, I've seen fires in this part of the country covering a thousand acres and traveling a mile an hour in the wind. It would take hundreds of men and thousands of dollars for tools and food supplies to make even a start at stopping one if it once gets started—"

"Hello! Hello!" A strong, cheerful voice came from up the creek.

Hank turned and saw almost his counterpart, both in man and horseflesh, coming down the muddy trail. The newcomer dismounted easily, stretching out a strong hand.

"I am Wilkerson, generally called 'Than'," said the newcomer.

"I am Tuttle, better known as 'Hank'," explained the other.

Still it rained. Packs were wet clean through although covered with canvas.

"Well, I guess it's never going to quit," offered Than. "We better try and get our stuff off and under cover of some kind."

"I reckon I've got a partner that knows something," thought Hank.

So they went to work, each understanding and doing his part. Soon a roaring fire was going, a pole set against a tree with a canvas thrown over it, and their supplies unpacked and stored under this makeshift shelter. As soon as the horses and mules were hobbled and put on feed for the night, the men were enjoying their bacon, fried potatoes, baking-powder biscuits and coffee. And as they satisfied their hunger they talked of their work.

"We won't have much fire in the woods this year with all this rain in June, and I don't believe there is anyone cutting timber around here," remarked Than.

"Maybe so," answered Hank, "but I just got orders from the inspector that if there wasn't anything else to do, we could pile and burn all the windfall and brush, especially along the roads. Guess we'll find enough to keep us busy."

"I wonder how much he thinks we could accomplish in clearing up the 500,000 acres we are supposed to be looking after. These fellows in Division R of the Interior Department don't know what this is out here," said Than. "They better come out and look over the country and then get Congress to let us spend a little money to hire help and get a little equipment with. I don't see what they expect only two

of us to accomplish in all this big, broken, timbered country—especially when we are furnishing our own tools, horses and grub and working for $60 a month. But let's stay with her, do the best we can, and some day there will be a real understanding of what is needed to protect and handle this great timbered country." Conversation lagged while both enjoyed their after-meal tobacco—Than his usual pipe and Hank his chew.

"I believe the first thing we should do is to build a cabin right on this flat," remarked Hank. "We surely need some kind of shelter for weather like this, and I think this would be a good location for a station. There is some fine lodgepole in that first draw up the creek, and maybe we can borrow a work horse and harness to drag them in from Pete Bennett, the old prospector down the canyon." "I know Pete," added Than, "and I believe that would be a fine idea."

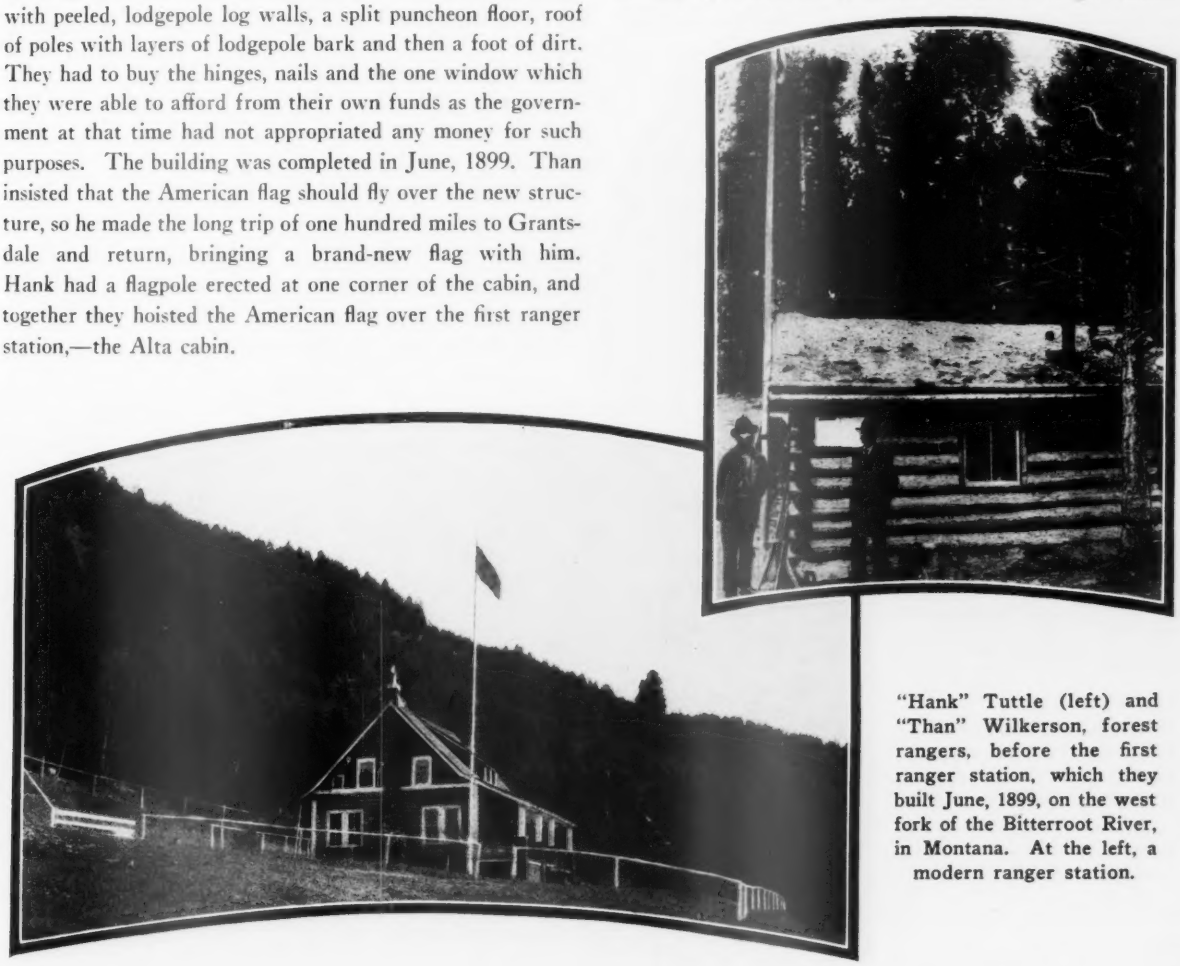
And so these two rangers went to work on the following morning, and by hard, steady application, in fifteen days had completed the first ranger station building constructed by forest officers on a National Forest. It was a one-room cabin, with peeled, lodgepole log walls, a split puncheon floor, roof of poles with layers of lodgepole bark and then a foot of dirt. They had to buy the hinges, nails and the one window which they were able to afford from their own funds as the government at that time had not appropriated any money for such purposes. The building was completed in June, 1899. Than insisted that the American flag should fly over the new structure, so he made the long trip of one hundred miles to Grantsdale and return, bringing a brand-new flag with him. Hank had a flagpole erected at one corner of the cabin, and together they hoisted the American flag over the first ranger station,—the Alta cabin.

Although Tuttle remained with the Service only a year or so after building the cabin, our old friend Than continuously worked at his job. He became grizzled around the temples but remained a sturdy, hard-working ranger, keen in all things pertaining to the administration and protection of the National Forests. He is now retired on a pension, having served nearly thirty years as a forest ranger.

Two years ago Than and I visited a modern ranger station.

"Well, this looks like something," said Than. "What a difference in things now and thirty years ago. We have lots of lookouts to spot fires, firefighters with modern equipment, thousands of miles of trails, roads and telephone lines. It seems a long step to the present time when each ranger handles six to a dozen men as protection guards, has his traveling expenses paid, and a decent house to live in.

"Through the years I did my best to bring these things about," remarked Than, "and there is just one thing now I would like to see done. I wish the old cabin at Alta could be fixed up a little and preserved as the first ranger station."



"Hank" Tuttle (left) and "Than" Wilkerson, forest rangers, before the first ranger station, which they built June, 1899, on the west fork of the Bitterroot River, in Montana. At the left, a modern ranger station.

Winning the Forest Range

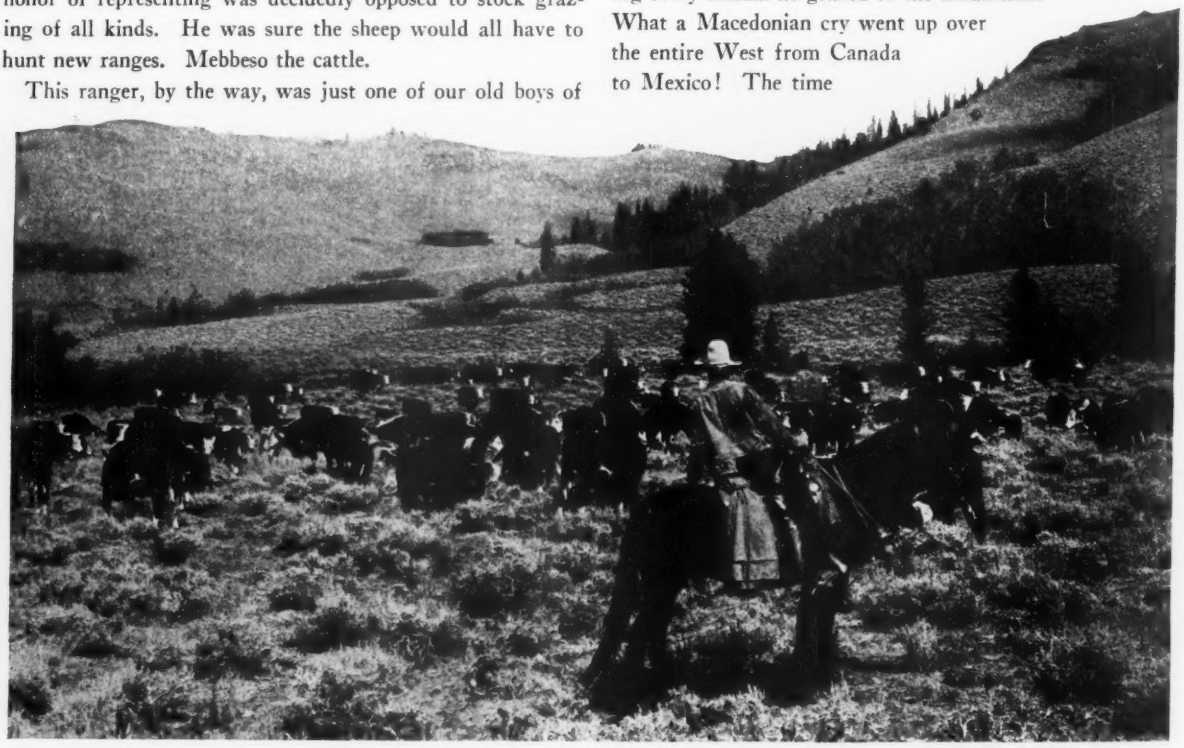
By Will C. Barnes

NORTHERN Arizona in 1897. The fall round-up in full swing—wild cows, wild horses and wild men in plenty. Came to our camp a new breed of human, labeled a forest ranger. He told us that Uncle Sam had about decided to take some steps towards protecting his property—the timbered areas which we had been using as our summer grazing grounds for some years. He rather opined, did this new-born official, that the government which he had the honor of representing was decidedly opposed to stock grazing of all kinds. He was sure the sheep would all have to hunt new ranges. Mebbeso the cattle.

This ranger, by the way, was just one of our old boys of the range. He had turned traitor, we felt, and sold himself about as did Judas. We didn't love him a little bit and were quite peeved when he asked everyone using the mountain ranges to fill out a lot of blanks he handed out. These called on us for full information as to when we first began to use the range, the number of cows we owned, how many calves branded each year, where were our ranches, how much hay did we raise for winter feeding, and a lot more foolish questions. Huh! We didn't tell such things even to the county assessor, much less this reformed cow person.

As for hay—well, that question surely did raise a merry laugh. There wasn't fifty acres of hay-producing land owned by all the cowmen in Arizona. It was root hog or die for the old Nellies in wintertime down that way. Some mighty uncomplimentary things, many reflecting seriously upon his ancestry and standing in polite society, were said about that young representative of our government.

Later came orders from the government that every stockman using those hallowed ranges must secure a permit covering every animal he grazed in the mountains. What a Macedonian cry went up over the entire West from Canada to Mexico! The time



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The grazing men—the cowmen and the sheepmen—were the shock troops of the fight that won the West to forestry, says the author, himself a stockman during the early days of the Forest Reserves

seemed ripe for hanging a forest ranger. Why not? Something had to be done to impress those Washington officials! No one was hung, however.

During the fall round-up of 1900, two long, lean young men appeared in the Arizona mountains. They said they came from Washington, D. C. Each carried a good-sized pack, plus cameras, field glasses and such plunder. They wore what were then rudely alluded to in the rowdy West as "funny clothes." They stayed with us for several days, measuring trees, taking photographs, gathering specimens of plants and flowers, watching the stock graze and talking to everybody they could get hold of. They even visited several sheepmen and trailed in the dust after bunches of woollies—which cost them considerable standing with the cowmen.

"Don Solomon gave orders for his herds to be held up along the forest boundary and drove a team to death to reach the telegraph station. The wires fairly sizzled with his messages to Washington, and, a few days later, hundreds of wobbly legged little lambs were lying round in the sun in the National Forest"

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Their names were Gifford Pinchot and Frederic K. V. Coville. They confided to us that they were sent out to make a report on grazing conditions in the mountains of northern Arizona. Both seemed favorably inclined toward cattle grazing but "viewed with alarm" the use of the ranges by sheep. This, of course, didn't hurt the cowmen's feelings a little bit. In fact, we did all we could to convince them that their attitude was exactly right. Later we heard they had advised the authorities in Washington that a reasonable amount of cattle grazing might be allowed but that sheep grazing should be limited to certain specified areas. All of which suited the cattlemen right down to the ground.

For several years previous to this—as early as 1896—we had heard reports that the President was creating some so-called "Forest Reserves" in the timbered parts of Arizona and other western states. But nobody got unduly excited about it. We had scrapped with the Indians, some rather hard-boiled whites, and with each other for these ranges, and, like all pioneers, we felt ourselves amply able to take care of our interests. We wanted to see the color of the man's hair who was going to put us off these lands.

So we good-naturedly took out the grazing permits which didn't cost us anything, lied freely and fluently about our numbers of stock and brandings, and drifted with the tide. Why worry? After all, Washington was 3,000 long miles away while we were on the ground and in full possession.

The real blow, however, came in 1905, when word went out that the government was planning to charge the stockmen for the use of the forest ranges. To be sure it was only a few cents a head—six cents in Arizona and New Mexico—for a whole season's grazing. But what irked them all was the idea of being made to pay even a single penny for the use of what the stockmen of the West felt honestly was theirs by right of conquest and possession. It wasn't the money, but the principle involved, that made them want to fight somebody.

In the meantime, Congress passed a law which took the Forestry Bureau from the General Land Office—the officials of which never did show a bit of sympathy toward the western stockmen—and put it into the Department of Agriculture. Likewise our visitor of former years was made Chief of the new Forest Service, which replaced the old organization. Pinchot proved to be not a bad sort. Very early in the game he seemed to realize that the best way to overcome the western

stockmen's prejudice against government officials was to employ western men—men who could talk their language, understood their troubles and knew their ways. So with rare good sense, the Chief Forester took into his service a group of grazing men who met these requirements. For his captain he picked an Arizona cowboy sheepherder, named Albert F. Potter, who knew the smell of corral dust and the taste of sheep dip, the difference between a bed ground and a lambing ground. Under Potter's guidance and scattered over the West from the Canadian border to the Mexican line, from the Sierras to the eastern slope of the Rockies, was a group of lieutenants trained in the school of their leader. Best of all they were absolutely fearless in their devotion to the new cause. What a body of men! Warriors all, they believed firmly in the policy of Roosevelt who said to "speak softly and carry a big stick." Great days those were for the grazing men. For say what you will, the grazing men were the shock troops of the fight that won the West for forestry. There was, of course, some opposition to the National Forest idea from many western people. But it was the western sheepmen and cattlemen who did the heavy fighting, who set off gas bombs and put up smoke screens, whose ululations over the rude invasion of their rights by these federal hirelings reached clear across the continent even into the most sacred precincts of the capitol at far-distant Washington.

To guide the new Forest Service through the first few tempestuous years, Pinchot picked Albert F. Potter, an Arizona cowboy-sheepherder

It was a rare bunch of men that Pinchot and Potter gathered round them to help get the stockmen of the West properly lined up. There was John H. Hatton, a farmer's boy, born and raised on the bleak prairies of North Dakota, who assisted in the accouchement of a large number of our western forests before he became the first grazing expert at San Francisco. Hatton was the only college graduate, as well as graduate forester, of the whole bunch.

Thomas P. MacKenzie, who grew up in a New Zealand sheep camp and who came to Oregon seeking adventure, found it in plenty as chief of grazing at Portland. Good old John Kerr, from Texas, who cut his first teeth on the handle of a branding iron, and wore cowboy boots at his baptism, got right into the thick of the fray in the Southwest at Albuquerque, New Mexico. There was Jesse W. Nelson, a Wyoming cowboy with years of experience. He was one of Buffalo Bill's best trick riders when he first opened his great Wild West Show back in 1896. He headed the grazing men at Denver, Colorado. Homer E. Fenn, born and raised in the mountains of Idaho, suave, diplomatic and handsome, a born politician and a fine all-round stockman, was chief at Ogden, Utah. For chief of grazing at Missoula, Montana, they picked Charles H. Adams, a lanky red-haired, hard-headed sheepherder. He was a man of prodigious energy, unusual tact, quick to grasp a problem and never afraid to try to solve it.

These were the type of men that guided the new Forest Service through its first few tempestuous years. Not only did they guide it but they won the admiration and respect of every western stockman who used the National Forest ranges.

There were many striking incidents in those pioneer days. Down on the Gila National Forest, in southern New Mexico, in the spring of 1907, the sheepmen were drifting up to the boundary intending to lamb on their lands inside the Forest. It had been a wet season. The ranges were soft and the grass was coming on slowly. Don Solomon Luna, a veteran of veterans among the New Mexico sheepmasters, with 40,000 woollies of the female sex behind him, was at the line the morning of the opening day. So was a bright young fellow fresh from an eastern forestry school. As an inspector from Washington, he represented the very last thing in brand-new ideas about forestry. Also, in his field outfit, he was a picture of sartorial elegance. He was there to protect the forest at all hazards. The Use Book, page 77, said plainly that stock should not be admitted to the forest ranges when the ground was soft and likely to be damaged by the animals' hooves. The range was soft—that was a self-evident fact. Ergo, the sheep could not be allowed to enter.

"But my ewes are to lamb in a week," pleaded Don Solomon Luna. "I must be on my lambing grounds within a few days or the lambs will begin to drop and I shall be ruined."

Blandly the young inspector informed him that he was not at all interested in the approaching maternity cases in the permittee's flocks. "That's your responsibility, not mine," he declared. "Ought to have thought of that before this. I'm here to protect these Forests from damage."

He waved that oft-defamed and much maligned Use Book before the man's eyes. The Mexican herders stood round their employer in mute amazement. What manner of man was this to defy the greatest flock-master in the country. He and his fathers and grandfathers before him had gone back and forth over these mountain ranges for 300 years as and when they pleased.

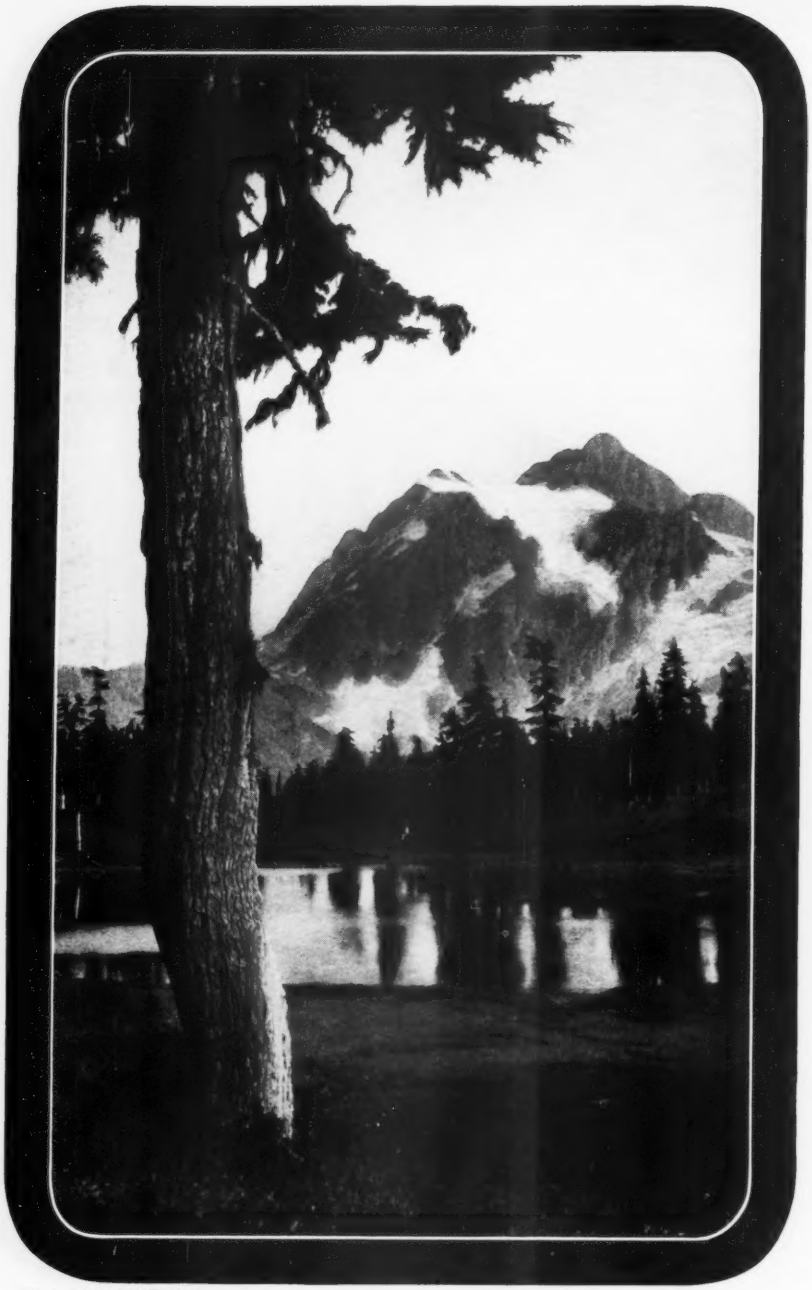
"*Valgame Dios, que hombre*—can such things be in a free country?"

The inspector was adamant. He represented the power and majesty of the whole United (*Continuing on page* 466)

Photograph by John Kable

"Ruddy stars grow pale
And glitter ghost-wise through the lustrous veil;
The fir's green pride, the cedar's droop and swoon,
The flaming maple's and the aspen's tune
All sink to shade and silence, where the trail
Coils through in dread; the lakes in silver mail
Sleep, and heed not the watch cry of the loon."

—Thomas Wood Stevens



Photograph by Bert Huntoon

Mount Shuksan

LIFT ME

Lift me up, hilltop, lift me high,
Be thou my ladder, leading to the sky,
Whereon I climb from out these level lands.

Let the large winds be angels on the rungs,
Murmuring wisdom in their foreign tongues,
Winding my garments, holding fast my hands.

Lift me up, mountain, lift me high up o'er
My brothers' rooftrees; spread for me a floor
Of furrowed cloud, stretched wide as desert sands.

Raise me to heights where only eagles are.
Let me live neighbor to the evening star.
Lift me up, mountains, reach me, winds, your hands.

—Frances Holstrom

"... Sentinel of the stillness,
Lord of the last lone land."

—Service

Photograph by Bert Huntoon

Mount Baker

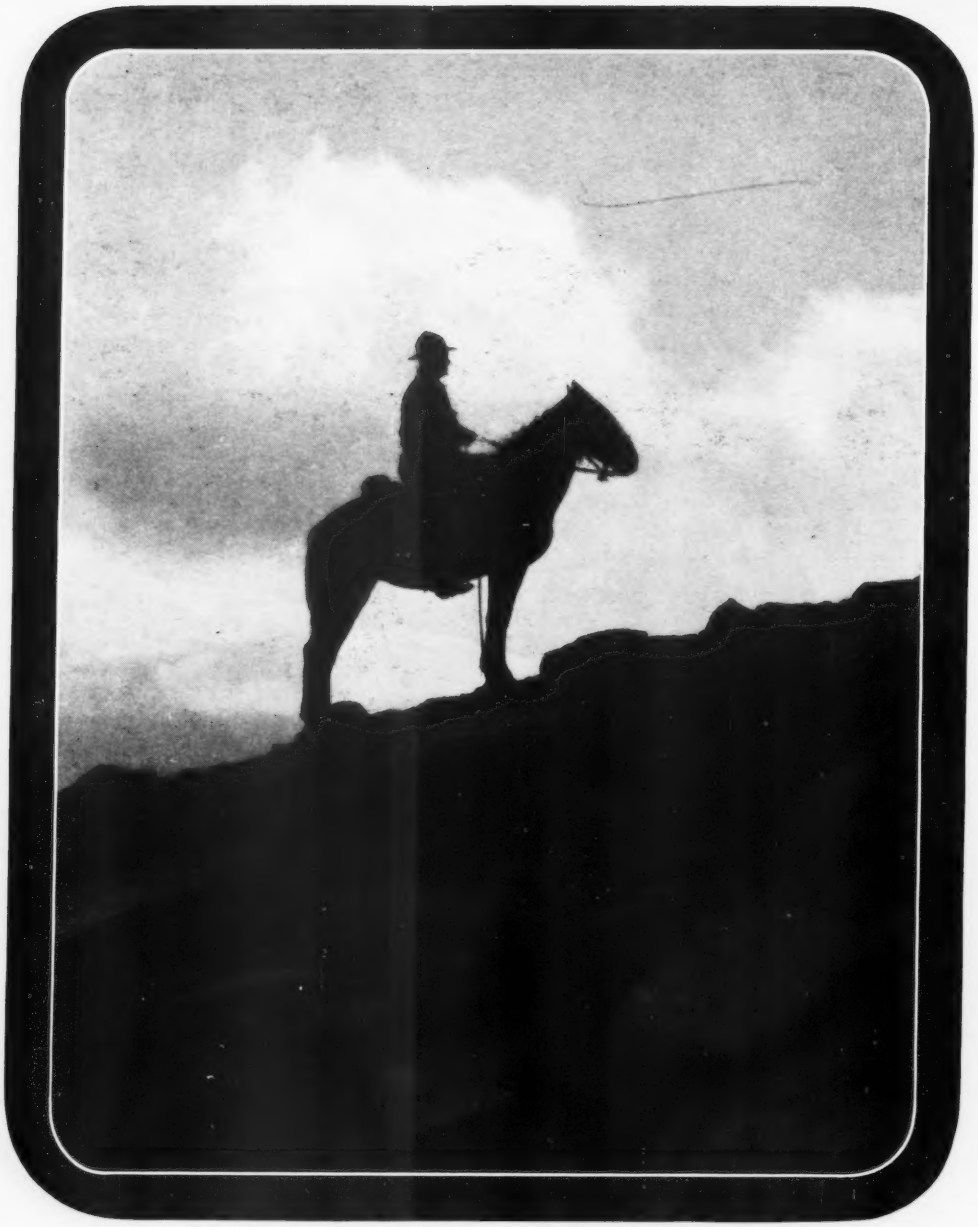
THE CALL

And have you heard the Call where world-old
silence broods—
And have you heard the Voice that speaks from
solitudes?

Lone the trails we ride that run
Where canyon shades shut out the sun.
Rock-gated is the opening pass
Whence bursts the mountain's awesome mass,
Where, far above the proudest height,
A searching eagle hangs in flight
And, ever soaring, wheeling, throws
A circling shadow on the snows. . . .

And you have heard the Call where world-old
silence broods—
And you have heard the Voice that speaks from
solitudes.

—Scott Leavitt



"RANGER BILL"

I rode on a lonely trail when night
From the depths of the canyons drew
A dusky veil over crag and height
And the wild land dimmed from view....

I must go on my way, for the long miles lead
By the mountain and cleft ravine;
And now must my mount be true indeed,
For we follow a way unseen.

Save a moon-rimmed cloud on the eastern line,
The sky wears an inky shroud.
So still are the masses of rock and pine
That the hoof beats call aloud....

And my horse goes true to the end of the trail,
Where the light of the camp shines out—
And true goes our purpose that will not fail
Till we pass through the gloom of doubt.

—Scott Leavitt

The National Forests Today

By R. Y. Stuart

ALMOST forty years have gone by since the first of the National Forest reserves were created. More than thirty years have passed since the basic law making possible the development of the present system of National Forest administration was enacted. The Forest Service, organized for the purpose of bringing about that development, is beginning its second quarter-century. What is in evidence as the outcome of the years? And what still remains to be done?

If we glance at the map we see that the National Forests are mainly in the West. A second glance shows that they mainly occupy the mountain sections. They cover the Cascade and Sierra ranges, outline somewhat less definitely the main masses of the Rocky Mountains, mark the Black Hills and Bighorns rising from the Great Plains, show where the Wasatch Mountains front the Great Basin, locate the Coast Ranges, and elsewhere distinguish various less important or familiar bodies of hill country. In the East, too, the National Forests coincide for the most part with rugged topography—the Ozark region, the southern Appalachians, the White Mountains in New England; but they leave out much more than they take in.

Of all the forest land in the West more than seven tenths is in National Forests; of that in the East, about one per cent. The distribution seems illogical from any point of view. Why not more National Forests in the East, or fewer in the West?

It is true that the present system of National Forests falls considerably short of constituting a symmetrical or entirely rational provision for taking care of public-forest needs. Anybody sitting down to devise an ideal scheme for the country as a whole would work out a plan different in many particulars. But in a practical world that is not the way most things are done, or can be done. And conditions in the two parts of the country are not altogether comparable. Public ownership ought to embrace a considerably greater percentage of the western forest lands than of the eastern.

In spite of three hundred years of forest misuse the East remains predominantly a wooded country wherever the white man found forests, except as land is kept open through continuous use and care or in some regions through persistent burning. Abandoned fields and pastures soon begin to revert to tree growth. Forest depletion and deterioration diminish the timber supply and lower the value of the growth, often to virtual worthlessness; but complete and permanent denudation is relatively infrequent. The eastern forest problem is primarily a problem of preventing forest abuse and of remedying the consequences of past abuse. The western problem is less chronic, and more acute.

Typical red fir forest in Washington. Of all the forest land in the West, seven-tenths is in the National Forests

With anything like the same treatment that the eastern forests have had, those of the West would be almost non-existent. They are very much harder to protect from fire, and they suffer more severely when fire passes through them. At the same time, their function as watershed cover on the mountains from which the semiarid West draws its irrigating streams and its hydroelectric power makes them even more basic for the public welfare than are the eastern forests. The latter are primarily valuable as a rule—though the rule has some very substantial exceptions—as sources of wood supply.

Southern shortleaf pine in the Ouachita National Forest, in Arkansas

From the standpoint of wood needs also, perpetuation of the western forests is imperative. Mining requires timber in large quantities; railroads are constant consumers; and the lumber industry is itself one of the greatest western industries. Permanent forests are required because the failure of local timber supplies would terribly handicap the region. Even though its needs could be met by drawing on eastern supplies, the cost would be prohibitive for many uses.

So there were the strongest reasons for beginning National Forest administration in the West. The primary reason, however, was that the policy of federal administration was originally a public lands policy pure and simple and was not initiated until after the eastern Public Domain timberlands were practically all gone. It began, in short, as a policy of reservation. In the West the National Forests are still often spoken of as reserves. To understand the National Forest system as it exists today it is necessary to make this the starting point.

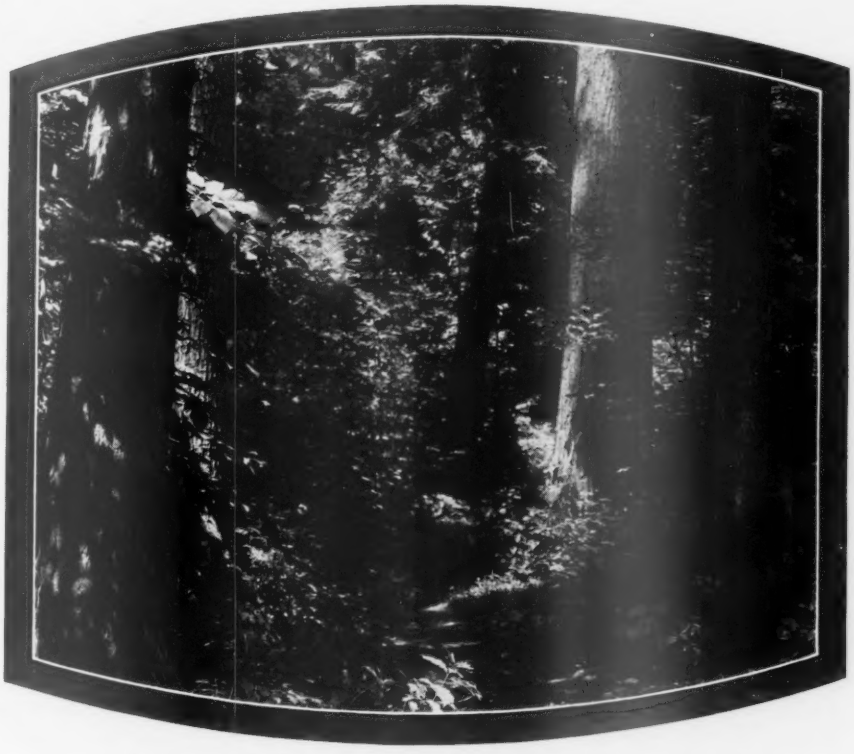
A rounded, adequate public policy of forestry for the United States is far too great a thing to become an actuality in any other way than by slow upbuilding. It is still a half-finished structure. In the West it has risen far enough so that its main outlines are clearly discernible. In the East not even its foundations are fully laid. Conditions profoundly unlike necessitate big differences in the character of the foundations, and will cause considerable differences in the completed building.

The reservation and federal administration of all the unappropriated Public Domain timberlands was first proposed by Carl Schurz, as Secretary of the Interior, in 1877. Instead of giving heed to this recommendation Congress passed laws opening still wider the door for those seeking to obtain the land. Fifteen years of persistent effort on the part of the conservationist group to obtain a law carrying out Schurz's recommendation was in some degree rewarded by the law of 1891, authorizing the President to set aside forest reservations. For a number of years this authority was sparingly exercised. Meanwhile, of course, millions upon millions of acres of the public timberlands—which in Schurz's day included extensive areas in the Lake States and the South—were passing into private hands. During Roosevelt's presidency forest reserves were rapidly created in an effort to convert all that was left of the Public Domain timberlands into National Forests. This soon caused Congress to curtail the authority of the President to add to the National Forest area. While some additions have been made of late years by Congress itself, complete attainment of the policy originally advocated by Schurz in 1877 has not even yet taken place. Nevertheless, roughly speaking, the western National Forests of today contain that part of the Public Domain timberlands which remained in the ownership of the government a little more than twenty years ago. In addition, they contain large areas of watershed lands on which sparse tree growth or brush constitutes, with other vegetation, a protective cover.

But the line that seemed to have been established marking off public timberland ownership from private is showing symptoms of dissolving. There is good reason to believe that a great deal of the private ownership will prove temporary, not permanent. The land will not stay put. It was taken up not because its claimants under the public-land laws wanted

the land itself, but because they wanted the valuable standing timber on it. After that is cut off the land often becomes a liability instead of an asset. Naturally, the owner of valueless land is indisposed to pay taxes on it indefinitely. He prefers to abandon title. A distinct drift of cutover forest land back into public ownership is beginning to show itself, in several Western States. Like the prodigal son, it returns impoverished; but its return receives considerably less welcome. And it comes back not to the federal government—its father's house, as it were—but to the unwilling state or county whose tax bills have not been satisfied. It goes, one might say, to the poorhouse, its substance wasted, to become a public charge.

To some extent the Forest Service is able to avert this drift of pauper land out of private into state or county ownership, through the limited authority conferred by the so-called land exchange laws. It can acquire private lands forming interior holdings within the forest boundaries, and in many cases outside lands nearby, giving in exchange for them National Forest timber. To be considered for acquisition through exchange the lands must of course not have been reduced to worthlessness. Under the exchange provision the western National Forest area is slowly increasing. This process of exchange, however, affords the possibility of meeting only to a very minor extent the land abandonment that appears impending. The plain fact of the matter is that, extensive as were the reservations for the National Forests, the carrying out of the policy was too long delayed. How far the states will be able to handle the land-abandonment situation is uncertain. How far it will be possible to induce the private owners, by lightening tax burdens and other forms of public aid and encouragement, to retain their forest lands and use them for permanent timber growing is also uncertain. The point is that, even with three-fourths of the forest lands of the West in federal and state ownership, a considerable forest land-use problem remains to be worked out. In the East the same problem looms on a much larger scale. New York and Pennsylvania are forehandedly grappling with it through extensive state forest ownership. The Lake States are moving in the same direction. In the South, state forests are as yet insignificant in size and number, while the prospect of land impoverishment and abandonment is staggering. The richer and more populous states can much more easily assume the financial burden of land acquisition, reforestation, and administration than can those of smaller resources. Under the Clarke-McNary law, enacted in 1924, a limited policy of federal acquisition in the Lake States and the South has taken shape. It is certain that private forestry will not for a long time to come, if ever, undertake the restoration to productiveness of the more badly depleted and poorer areas. Private forestry will begin first where the conditions are best, and gradually extend; meanwhile forest abuse and destructive lumbering of the less productive privately owned lands will proceed unless brought under some form of public control. Thus the pauper acres will tend to multiply.



Virgin white pine in the Allegheny National Forest, in Pennsylvania

To what degree National Forest extension will be adopted as a tool for working out the ominous eastern forest problem no one can say at present. Federal finances seem to preclude the likelihood of any early move towards a purchase policy of scope adequate to contribute materially to a solution. The public has not yet waked up to the nature of the problem. The awakening will begin at the bottom, not at the top; in the communities and the states pinched by the decline in local resources, industries, population, and land values, not among the leaders of national thought, whose attention is turned in other directions. When the awakening really comes, things will begin to happen.

The most outstanding contribution of the National Forest policy hitherto towards the eventual solution of the country's forest problem has been its development of sound principles and practices of public (*Continuing on page* 476)

The Four Foresters

Who Have Guided the Destinies of the United States Forest Service in the Administration of the National Forests

BOUND up in the lives of four men—Pinchot, Graves, Greeley and Stuart—is the history of the National Forests. Gifford Pinchot was the trail breaker and organizer and Robert Young Stuart today leads the march of wise administration of the federal forest resources over the way that was cleared by Henry Solon Graves and William Buckhout Greeley.

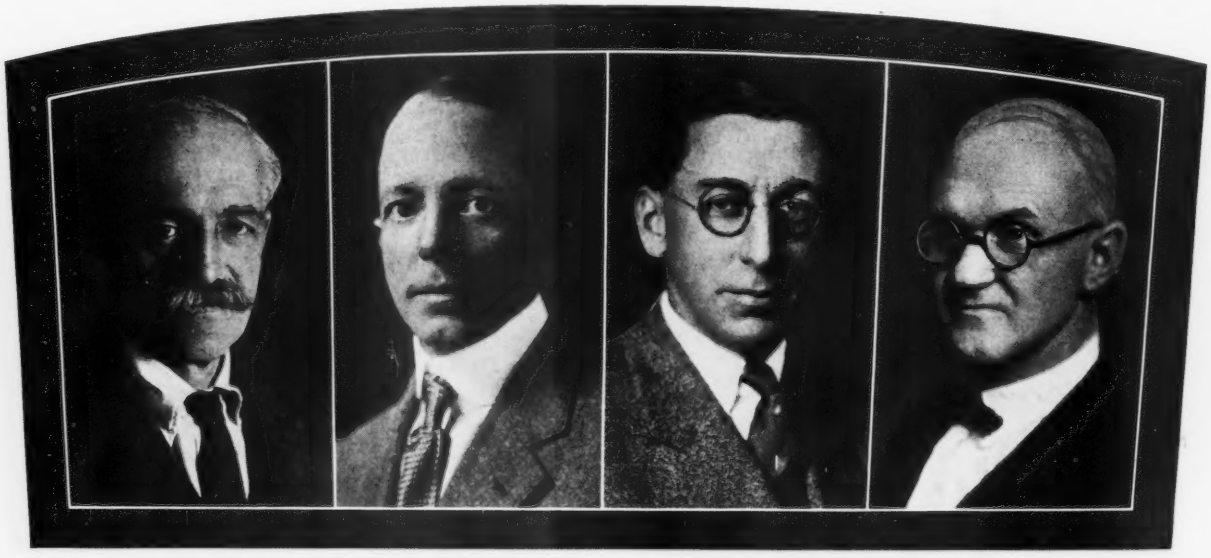
Gifford Pinchot first headed the promotion of scientific management of timbered lands under the Forest Service. Appointed Chief in 1898, under his leadership a national forestry sentiment was created. Wise use for the present and provision for the future changed from a theory to a principle. In 1905 he was made Chief Forester of the newly organized Forest Service and served until 1910. During these five years, with the vigorous backing of Roosevelt, he not only laid the foundation but he constructed the National Forest System which today ranks as the outstanding conservation achievement of the times.

Henry Solon Graves succeeded Mr. Pinchot as Chief Forester. Under his leadership administration of the National Forests was refined, boundaries were adjusted and expanded, revenues from grazing and timber sales were doubled and recreational uses recognized. Forest land was classified, the Weeks Law was passed, and National Forests in the East inaugurated. The development of the National Forests by road-building was begun, and the important work of the Forest Products Laboratory at Madison, Wisconsin, went forward with an impetus. Colonel Graves was the War Forester, in that he served during the World War as Lieutenant Colonel in charge of forest operations abroad. He returned to Yale as Dean of the Forest School in 1920.

William Buckhout Greeley was the next to head the federal work in forestry. Becoming a member of the Forest Service in 1904, he advanced through all the technical grades to the position of Chief Forester. While he held this office not only was progress in protective work marked, but by systematic plans the effective use of each resource was developed, such as timber management and utilization, organization of a comprehensive system of roads and highways, and increased use of the recreational resources of the forest areas. Forestry and forest protection were extended to state and private lands by the Clarke-McNary act of 1924. In 1928 he became secretary-manager for the West Coast Lumberman's Association.

Robert Young Stuart entered the Forest Service in 1906. He, too, has held the various technical positions in the service, and served as Commissioner of Forestry, and Secretary of Forests and Waters of the State of Pennsylvania.

As the present Chief Forester he has been active in developing more effective protection of the National Forests. The 15,000,000-acre land-acquisition program in the East approved by the National Forest Reservation Commission, the appropriation of $3,000,000 for each of two years for this purpose and increased sums for the Forest Service have been effected during his tenure of office.



Gifford Pinchot **Henry S. Graves** **William B. Greeley** **Robert Y. Stuart**

"June Eleventh" and the Homestead Hysteria

By E. A. Sherman

IN National Forest history the term "June 11" has a very definite and special meaning. With it are associated ideas of land settlement, land classification, real home-seeking, attempts at timber grabbing, political buncombe, economic hokum, rainbow painting by visionaries, and plenty of grueling hard work. The term is derived from the date of the approval of the "Forest Homestead Law"—June 11, 1906. For brevity and convenience, the forest men promptly dropped the 1906 and applied the surname of "June 11" to the act and almost everything connected with it. The "June 11" law, — "June 11" work,—"June 11" claim,—"June 11" settlers, are examples that tell their own story.

The act was written by George W. Woodruff, principal law officer of the Forest Service, shortly after the transfer of the "Forest Reserves" from the Department of the Interior to the Department of Agriculture, and was introduced in Congress by Congressman Mondell of Wyoming. It was drawn to meet an urgent need.

The homesteader from Canada on Marble Creek. Lyn Lindquist, whose home was in Estevan, was not content with one, but actually held four claims on Marble Creek at one time

The presidential proclamations creating forest reservations were always worded to safeguard valid existing claims and settlements and all properly recorded entries. They curtailed no rights which had already been initiated, but permitted such rights to ripen to their beneficial conclusion. The man who had already filed upon a homestead had the right to proceed with his settlement, cultivation, and occupancy and to make final proof and secure his title papers from the Government just as though no forest reservation existed. This man, if he halfway complied with the requirements of the homestead law, had no grievance. But there were two classes of cases that did arouse more or less criticism, some of it really justified. The boundaries of the reserves were hastily drawn and in some instances included treeless lands suitable for farming and stock-raising. The law prevented further settlement of forest reservation lands regardless of character, and land seekers, finding themselves prohibited from homesteading treeless land because it was in a "Forest Reservation," naturally rose up in protest.

Opposition was also voiced by the squatter on unsurveyed land who found that the reservation of the land for forest purposes threatened indefinitely to delay the survey of the lands upon which he had settled. Under the provisions of the homestead law a citizen who settles upon the Public Domain, cultivates it, and makes it his home prior to survey has the right to file upon 160 acres as soon as the area is officially sectionized, and secure his patent upon compliance with the cultivation and settlement require-

ments of the law; but he cannot make entry of his homestead application until the Government has surveyed the land. Seeking to accommodate as many settlers as possible and to dispose of as many homesteads as possible, the public land surveys were naturally most actively pushed in regions outside forest reservation boundaries. As a result, the squatter in a forest reservation found himself marooned far from the main current of settlement. Naturally he complained. Who wouldn't? He complained of two things, first, because he could not get title to his homestead, and second, because the lands adjoining him were reserved from homesteading and he was deprived of neighbors.

Nellie Kildee, residing at Wallace, Idaho, where she conducted a rooming or boarding house, filed on this claim as a homesteader in 1905

This photograph to the left shows the cabin and "clearing" on Mrs. Kildee's claim on May 31, 1909, when she was still asserting her right to this land

This contingency had been foreseen in drafting the Act of June 4, 1897, providing for the administration of forest reservations. And there was included in that law the provision that patented and unperfected bona fide claims within the forest reservations could be exchanged for an equal area of vacant land open to settlement outside the reservations. This offered a means whereby the settler finding himself marooned in a forest reservation could give up his claim and select another, free of settlement restrictions. There is no doubt that Congress passed this provision out of sympathy for the isolated settler, but unfortunately the wording of the measure made it applicable to any "owner" of land in a forest reserve, even to the checkerboard holdings of a railroad grant, and out of this simple provision there came the iniquitous timber thievery perpetrated by "Forest lieu scrip." However, that is another story.

Gifford Pinchot struck at this iniquitous provision swiftly and effectively. The National Forests were placed under his jurisdiction February 1, 1905, and Congress repealed the Forest lieu law, March 3, 1905. The new Forest Service adopted new tactics in dealing with the settlement problem in National Forests. A natural outgrowth of the policy of putting all lands to their highest use was that lands which were chiefly valuable for agriculture should be used for agriculture. Mr. Woodruff therefore turned his hand to the drafting of a homestead law which would allow farms to be established within the Forests where farming was practical.

This law provided for opening to entry upon application lands which the Secretary of Agriculture considered "chiefly valuable for agriculture" and not needed for public purposes. It provided means for promptly securing special surveys so the entryman might secure patent without awaiting the extension of the public-land surveys to the region generally. It authorized metes and bounds surveys adaptable to mountain conditions so the landseeker could include within his entry the level, cultivable lands on the floor of a narrow and crooked valley without being forced onto the steep hillsides by a rectangular delimitation. For the man who had already exhausted his homestead right and had squatted upon the lands of a Forest Reserve prior to January 1, 1906, an additional homestead right was granted upon the payment of $2.50 per acre. The homestead was limited to 160 acres in extent and to one mile in length, measured between the cardinal points of the compass.

Although the law was not signed until June 11 and the leaders of the new Forest Service were already in the field busily engaged in other work, nevertheless they promptly proceeded to organize for this new activity. The appropriation bill made no special provision for such additional expense; nevertheless other work considered less urgent was curtailed and a few men at critical points studied in the field the problem of homestead classification. Thousands of people were clamoring to be allowed to settle on National Forest lands. The objective of the overwhelming majority was to get a piece of valuable timberland that could be sold at a profit. Possibly one out of every fifty applicants was a real farmer seeking farm land. The Forest Service experienced no difficulty in dealing with him; but the drygoods clerk, the barber, the doctor, the dentist, the school "marm" and the trained nurse, who all applied for valuable timberlands, raised their voices to high heaven when their naïve requests were denied.

When the agricultural appropriation bill came before Congress the next winter for consideration a battle royal was staged by western Congressmen posing as champions of the honest homesteader. The following plea made by Senator Fulton of Oregon in a debate in the Senate on the agricultural appropriation bill February 18, 1907, is typical of the trend of western political thought at that time:

"The truth is, this bureau (Forest Service) is composed of dreamers and theorists, but beyond and outside the domain of their theories and their dreams is the everyday, busy, bustling, throbbing world of human endeavor, where real men are at work producing substantial results. I know something of the importance of the home builder to the State. I know far better than does this bureau chief the obstacles the home builder will overcome and the hardships he will endure to secure for himself and family an abiding place. While these chiefs of the Bureau of Forestry sit within their marble halls and theorize and dream of waters conserved, forests and streams protected and preserved throughout the ages and the ages, the lowly pioneer is climbing the mountain side, where he will erect his humble cabin, and within the shadow of the whispering pines and the lofty firs of the western forest engage in the laborious work of carving out for himself and his loved ones a home and a dwelling place. It is of him I think and for him I take my stand today."

The pathos of such a picture would break one's heart, were it not for the fact that the "lowly pioneer" of that time "climbing the mountain side" was all too frequently trying to get title to 160 acres of choice timberland, which he had already bargained to sell later to some big lumber company.

It was some time before the Forest Service was able to get over to the people of the West the idea that the forest homestead act was not actually another "Timber and Stone Act" cleverly disguised, affording a means of getting a quarter section of Uncle Sam's most valuable saw timber. It was equally difficult to convince the public that the Forest Service was prepared to administer the law impartially and actually to open to entry lands which were found to meet the basic requirement of being "chiefly valu- (*Continuing on page* 461)

Showing the wonderful timber on the "homestead" claim of J. B. Foreman, located in the spring of 1904 and photographed in the fall of 1905. He was an employee of the Big Four Lumber Company at the time, and his claim was defeated by prior claim of scrip

Game Management in the National Forests

By Aldo Leopold

THE administration of the National Forests of America has for its real purpose the perpetuation of life—human, plant and animal life. Of first importance is human life, and so closely related is this to tree and plant life, so vital are the influences of the forest, that their problems have been fashioned into the major problems of forest management and administration.

Of next importance—and ever increasing—is the problem of animal and bird life. Driven from their once great range by civilization the wild life that was at one time America's most picturesque heritage has found refuge in the National Forests. Under protection their numbers have multiplied, and with it has come a new responsibility and a greater problem for the administrators of the National Forests. The wild life census of 1928 indicated there were nearly one million game animals within the boundaries of the National Forests—748,000 deer, 78,000 elk, 56,000 bear, 20,000 mountain goat, 14,000 mountain sheep, 9,000 moose, and lesser numbers of antelope, caribou and other animals.

The National Forests were placed under management in 1905. Up to that time the game-conservation movement had given birth to two major ideas. The first was the reservation or park idea—withdrawing samples of game range from economic development with a view to the perpetuation of threatened species. This has since grown to include the refuge idea. The second was the idea of limiting the annual kill on hunting grounds to the annual increment or "natural increase" of the game thereon. This idea of limitation of kill was really contemporaneous with National Forests, and part of its development may be credited to the foresters who had them in charge. In the interim, however, one additional major idea has emerged. This idea is corollary to the idea of limiting the kill to the annual increase. It asserts that the annual increment of any given game population may be increased at will by manipulating its environment. Such increase is limited only by the carrying capacity of the range, or, more rarely, by the unimpeded increase rate or "breeding potential" of the species.

For instance, a herd of twenty deer may now be holding its own under a kill of one buck a year. Under the "limitation of kill" idea, the killing of only one would be allowed. But under the idea of "environmental control" some factor such as food, cover, predators, disease, or parasites would be manipulated so as to allow of killing two or more bucks. However, no manipulation of factors can make it safe to exceed, or even approach, the breeding potential, which for twenty deer is about five bucks.

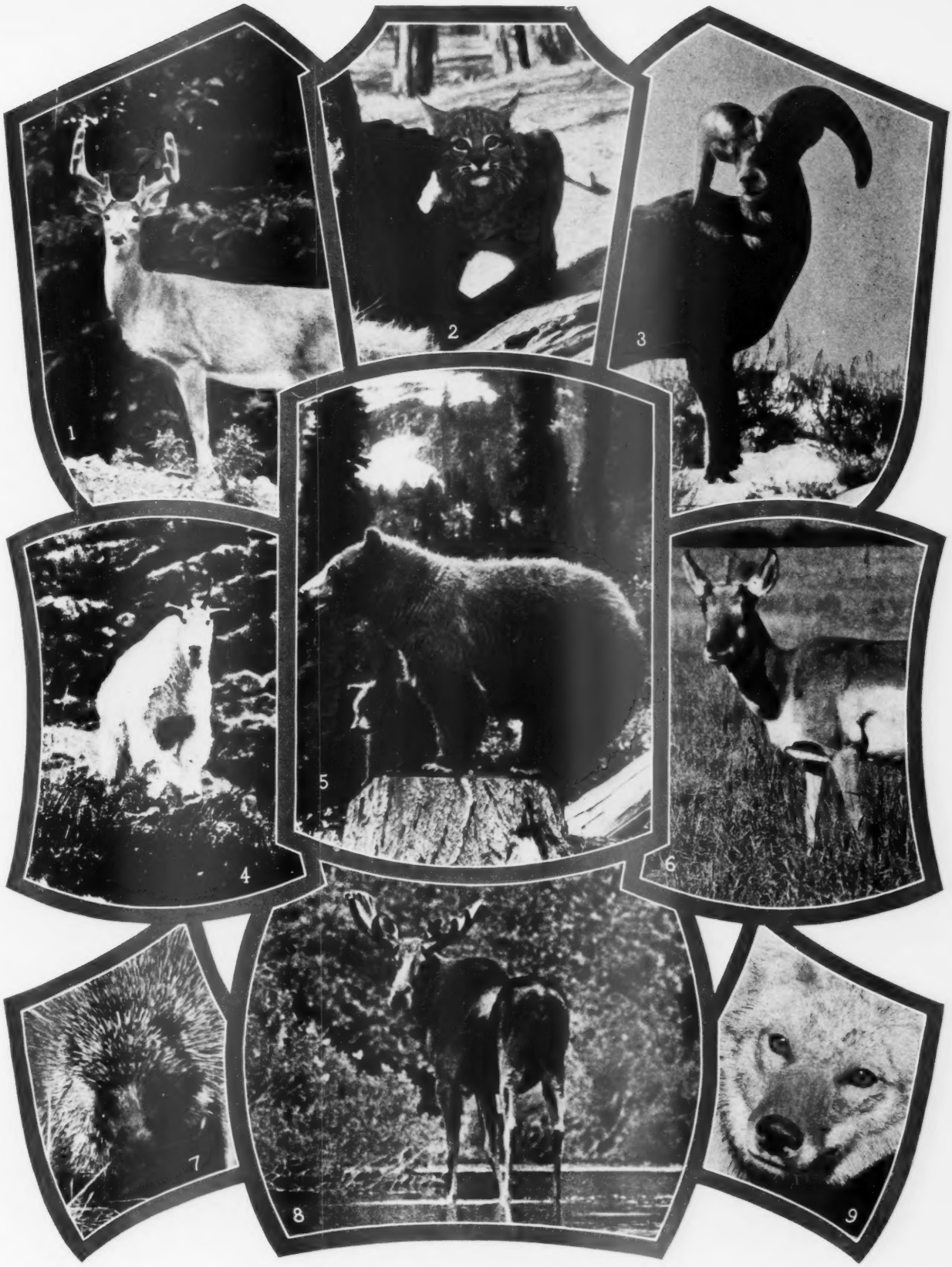
Environmental control, in its essence, and as applied to hunting grounds, is in effect the shifting of mortality from natural enemies to human hunters. It is not a new idea. In various empirical forms it has been practiced in Europe since the Middle Ages, and in Asia since the days of Genghis Khan. The biological equation responsible for its success was probably not understood, but this did not worry the Great Khan as long as his hunting was good.

It should, however, worry us. Environmental control, like every other really potent idea, is a two-edged sword. It is the only possible way of keeping alive the sport of hunting in the face of unregulated human population growth. This is one edge of the sword. The other is that overcontrol is open to many abuses. A case in point is the bitterness which European nature-lovers feel toward the excessive and indiscriminate predator control practiced on private hunting preserves. This should be a lesson to managers of both private and public hunting grounds in this country. Moreover, excessive manipulation of environment tends to artificialize sport, and thus destroy the very recreational values which the conservation movement seeks to retain.

By and large, these abuses, as far as America is concerned, are in and of the future. For the present, controls are not practiced at all except as the incidental result of other activities. The question to be here discussed is: How do they, and the other basic mechanisms of game management, bear on the future of game on the National Forests?

It should first of all be observed that while the old ideas of reservation and limitation can be put into effect through legislative enactments, the idea of controlled environments has little or nothing to do with law. Laws cannot restore life to the overgrazed forage plants of the Kaibab National Forest, in Arizona. It is these dead mahogany bushes, and not the edicts of legislatures or conservation societies, which will shortly limit the deer population of the Kaibab, and this limit will hold for several decades to come.

The overgrazing of the Kaibab, though foreseen years ago by experts, at this time represents the restoration of something gone. A much better example of the need for environmental control is to be found on the Gila and Datil National Forests, in New Mexico, where the deer-carrying capacity is now in process of being badly reduced by deer and cattle grazing, not through the destruction of the forage as a whole, but by the elimination of two particular forage plants, live oak and mountain mahogany. The same grazing has let in a vast amount of coniferous reproduction, which will make splendid additional deer coverts. Forest Service protection has restored the grass to a large part of this range, but not the browse. The net result a decade hence will be an unbalanced range, offering deer—and to a lesser extent, cattle—an excess of coverts coupled with a deficiency of winter feed. Here is a threatening situation so complex that even trained



WILD LIFE ON THE NATIONAL FORESTS

(1) Eastern White-Tail Deer (2) Lynx (3) Mountain Sheep (4) Mountain Goat (5) Black Bear and Cub
(6) Antelope (7) Porcupine (8) Bull Moose (9) Coyote

foresters may fail to see it. Successful restoration of grass and conifers may seem to them a sufficient accomplishment, as indeed it would be on any ordinary forest. But this region is so rough and inaccessible that its recreational value seems to me to far exceed its timber-producing value. It is debatable whether creating here a balanced environment for game should not be a primary objective of National Forest administration.

One already familiar aspect of environmental manipulation in the interest of game is the predator control work undertaken by the United States Biological Survey in cooperation with the states. Of course the primary interest is livestock, but this does not change the biological effect. Much of the reported recent increase in National Forest game may safely be ascribed to this work. The future, however, must bring a greater recognition of the needs of game, as distinct from those of livestock.

By and large, future predator control must be localized and discriminate, with game management as one of its primary objectives. There should probably, in most localities, be more control of small and perhaps less of large predators. It is possible that the low net productivity of many deer herds is due to the nonremoval of superannuated females coupled with high fawn-mortality. Continuation of such a tendency might easily overgraze a range with but a small net production of killable bucks to show for it.

Intelligent manipulation of game environments is impossible without research. In only a few cases are the main factors affecting National Forest game as yet known. This is no reason for a do-nothing attitude, but it is a powerful reason for a radical expansion in the game research program.

The foregoing sketch tries to show the potentialities and dangers of environmental manipulation as a means of enhancing the crop of game on the National Forests. It is possibly not very convincing, but this is because research has yet to disclose what to manipulate. It is nevertheless true, because the inexorable laws of mathematics decree that environmental factors alone prevent the realization of the enormous breeding potential inherent in each species. The only question is: What are they? Which ones can be beneficially controlled? These questions research must answer.

The "reservation" idea has enjoyed a satisfactory growth, and requires no lengthy comment. A far-flung system of refuges is gradually being built up. These, to be sure, differ somewhat from the original idea of preserving a sample of threatened species. Refuges are a machine to feed breeding stock to the adjoining range; reservations are a museum where specimens are set away for safe keeping.

The limitation-of-kill idea has not developed rapidly. Since its inception, a new need for it has come to light, namely, the need of regulating the mob of hunters as well as limiting the kill of game. There are already many localities in the National Forests where the hunters are thick enough to destroy the recreational value of the hunting ground, quite regardless of their effect on the game. This is true even on some of the "wilderness areas" set aside for wilderness recreation. Unfortunately many hunters are too thick-skinned to be annoyed. Nevertheless it is unthinkable that the public-service value of the national property should be allowed to progressively deteriorate from overcrowding.

One basic question affecting the future is whether the state conservation departments will improve rapidly enough to merit continuance of their primary control over National Forest game resources. There has been improvement, but it is spotty and slow, and sometimes offset by relapses. If National Forest game alone were at stake, I would say the evidence better supports a negative than a positive answer. But the game resources outside the National Forests demand a revolution in the quality of state leadership in any event.

In conclusion, it may fairly be said that game management has made a fair start in the National Forests; that the status of game in the gross or quantitative sense is less discouraging than in the country at large, and that game activities on the National Forest have spread a valuable leaven of ideas into the surrounding territories. The National Forests are the largest public shooting grounds operated by any nation. Neither their present nor their potential social value as such are as yet appreciated. Their management is beset by many perplexing difficulties, due to accelerating human population pressure and to lack of knowledge. The first cannot as yet be helped. The second demands facts and yet more facts.

The next most important need, in my opinion, is a more flexible conception of the relative importance of game and timber production respectively. The National Forests were founded on the assumption of impending timber famine. Under this assumption nearly every acre of National Forest land, no matter how much or what quality of timber it would grow, has been dedicated to timber production, with all other possible "crops" relegated to second place.

The ensuing twenty-five years of social and economic evaluation have not undermined the validity of the timber-famine idea, but they have split it up into certain component parts which differ from each other, and they have added certain new ideas unheard of in 1905. The present situation in my mind sums up as follows:

1. Timber famine is more a matter of quality than quantity. It is the large, high-grade timber which will be scarce, and least likely to be produced on private lands.

2. Timber competition is as important as timber famine. Wood must battle for markets against wood substitutes.

3. In this battle, a complete realignment of wood uses may take place. The ultimate place of wood in the national economy will be largely determined by the skill with which wood is grown, advertised, harvested, and used.

4. No one can predict the outcome, but it is daily clearer that, in this battle, wood grown on rich, accessible land under intensive forestry will have a competitive advantage over that grown on poor, rough land.

5. Meanwhile, the existence of a wilderness-recreation famine has emerged as an incontrovertible fact.

6. The logical deduction is to concentrate silviculture operations on the richer and more accessible portions of the National Forests with emphasis on high-quality timber, and to dedicate the remaining portions primarily to recreational functions. These functions include game management and various forms of recreation, all the way from wilderness areas on the one hand to tourist areas on the other.

Forest Recreation Comes of Age

By L. F. Kneipp

ONLY one who has made extended trips through the National Forests during the vacation period can realize the extent to which these areas are now used for outdoor recreation by the people of the United States. One must see the endless processions of motor cars, their tags representing almost every state in the union, the campgrounds dotted with tents and automobiles, the teeming picnic grounds, the overflowing summer-home communities, the crowded resorts and camps, the hikers along the trails, the fishermen, the swarms of hunters, to realize how important this particular service of the forest has become as an offset to the intensity of modern existence.

Many factors have tended to modify earlier concepts of the major social and economic service of forests. People no longer are much concerned as to sources of building materials or of food. They are becoming increasingly concerned as to sources of beauty, inspiration and recreation, as to the preservation of conditions under which the traditions and characteristics of American life can be perpetuated. There are already National Forest ranger districts in which a tree in place as a living element of landscape beauty is considered much more valuable than the boards into which it could be converted; a flower-decked meadow more essential than the lamb chops or steaks which its forage could produce. Nor is it evident that this new form of social service of the forest is less important, less desirable socially or economically, than the production of purely material commodities. No forester need develop scruples of conscience against other than the traditional uses of his trees or soils, provided the new forms of service are equally or more important. To the contrary, foresters are under a distinct obligation to keep in touch with and truly determine public thought and public needs in relation to forests and to shape their administrative plans toward a realization of the best net public service.

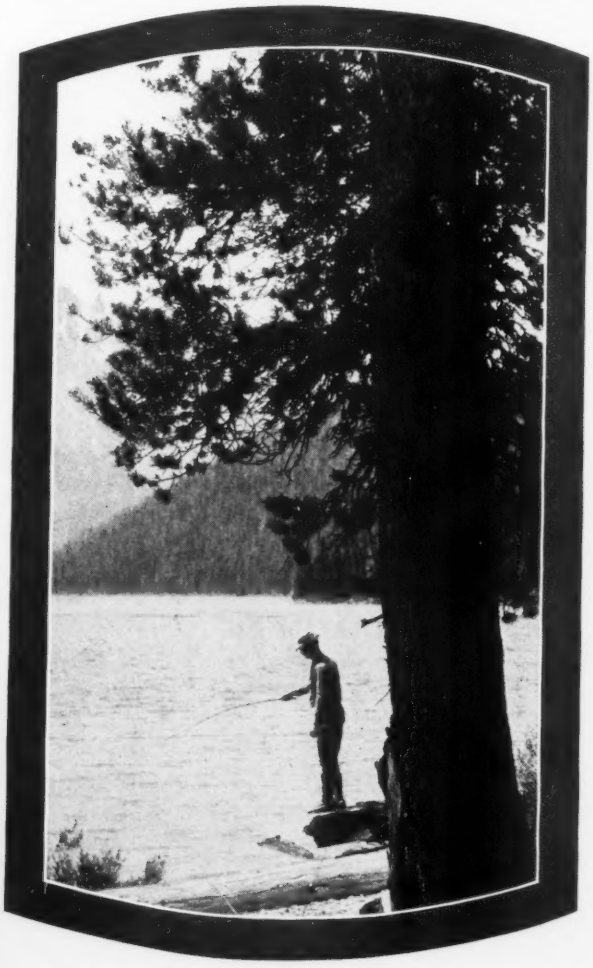
However much it may be deplored, the machine age has made it possible for the people of the United States to supply not only their needs but their luxuries with a greatly reduced expenditure of time and effort. As a result leisure time has increased beyond all earlier expectations and with it the means for its more complete utilization, among which may be included motor cars and improved highways and roads. Although the National Forests were probably the last major areas to feel the impulse of the good-roads movement special provision by Congress has made it possible to bring them well to the forefront in this respect and the 61,131 miles of forest highway and road which today are open to the public give ready access to a very multitude of areas of rare scenic beauty and recreational value.

There has been a consistent relationship between the increase in the number of National Forest visitors and the increase in

Nearly five million campers and picnickers visit the National Forests of the nation every year

leisure time, number of privately owned automobiles and miles of improved forest roads. There is, of course, no way in which the number of visitors per year accurately can be determined or the nature or extent of their use of National Forests precisely measured. The most that can be attempted is a system of checks and estimates based upon the best available data, such as traffic counts, bus and railroad business, campground registrations, hotel and resort registrations, sales by filling stations and other business enterprises, and the known occupancy of summer homes by owners and guests. Repetitions obviously are unavoidable; the same persons may visit two or more forests during a single tour, or the same forest several different times in a season. There is no pretense of extreme accuracy in these estimates; their value lies rather in their year-to-year comparability.

But taking them for what they are worth, they illustrate a surprising growth in recreational use of the National Forests. In 1917, when the first systematic estimate was made, it totaled 3,160,000 persons; in 1929, 31,750,000—a tenfold increase in thirteen years. The use of the National Forests in 1929 by the 24,626,000 transient motorists was, of course, brief and casual but nevertheless this class creates serious obligations for protection of public health and public property. But even though this entire class were dismissed from consideration, which they cannot be, the remaining 7,000,000 summer visitors would represent a public use of large proportions.



The lakes and streams of the National Forests and Parks represent the last free fishing grounds of America, luring millions of fishermen

The trails of the National Forests attract outdoor enthusiasts—this happy group was "snapped" on the Mt. Willard trail in the White Mountain National Forest, in New Hampshire

Specifically, these millions who make a more direct and extended use of the National Forests divide themselves into the following classes: Special-use permittees and their guests, 376,800; hotel and resort guests, 1,796,000; campers, 1,903,000; picnickers, 3,056,000. To these classes forest recreation is a very real and vital source of mental and physical stimulus and of actual recreation.

Custom and culture now make almost imperatively necessary some change in the normal modes of life, some variation in the environment of each person or family, during the summer vacation period. But even in these relatively opulent days, and especially to the heads of families, the problem of

cost, of financial ways and means often is still a pressing one. When a family includes several young members, lusty of appetite and eager for their proper share of entertainments and thrills, even the reasonable charges of resorts and private campgrounds make heavy drains upon the family budget.

But if a National Forest can be found within reasonable cruising distance, the problem is reduced to much simpler dimensions, for within these public properties that part of the public which exercises reasonable care in the use of fire, reasonable consideration of their fellow-campers in the use of campgrounds, and reasonable regard for sanitation and the health of others, can depend upon a hearty welcome and the very minimum of restriction in the enjoyment of the many and varied beauties and delights of nature. The very laws under which the National Forests were created provide for their public use and occupancy. The more people who make use of them, the more there are who develop an understanding of the service and importance and necessity of forests and a love and appreciation of them that reflects itself in more intelligent appraisal of their social and economic significance. The cash return to the treasury is one of the least important of the benefits derived through large public use of the National Forest lands.

The National Forests are not only sources of beauty and inspiration, but are increasingly valuable as play places for the people

Conditions rapidly are becoming such that few of the larger centers of population are now beyond reasonable access to a National Forest. For the system of National Forests already is widespread and rapidly growing in extent through the establishment of new units under the Weeks law and the Clarke-McNary law. There are today but few important forest regions or chains of mountains of which some part is not embraced within a National Forest. Beginning in Alaska, they cover the sweep of the Cascades, the Sierra Nevadas, the Siskiyous and the Coast Range; they mark lesser outlying chains, they delineate the Continental Divide, the Rockies, the Uintas, the Wasatch Range, the Black Hills; they contain examples of the Ouachitas and Ozarks, the White Mountains and the Appalachians. Finally one finds within them representative portions of the Lake States and the Southern pine belt. Exclusive of Alaska and Porto Rico the 147 administrative units are distributed throughout twenty-nine of the states, their gross area of 163,167,438 acres representing eight and one-half per cent of the total land area of the continental United States. There are few sections of the country whose citizens cannot readily enjoy the beauties and pleasures of the National Forests with reasonable ease and economy.

There are many, including foresters, who look askance at the growing use of these properties by multiplying millions of people for outdoor recreational purposes and question whether it should not be restrained, if not prohibited. King Canute's classic example should not be forgotten. The very nature, extent and distribution of the National Forests mili-

tate against rigid restriction of public use; as does the demonstrated necessity for large-scale public provision of outdoor recreational facilities as wholesome offsets to the intensity of modern existence. Proper guidance of the widespread impulse to get back to nature offers greater promise of success than attempts at its restraint.

The two main counts against public use of the forests are the increased fire danger and the increased menace to public health. Both are very real hazards, even though no consistent relationship has been established, statistically or otherwise, between the increase in numbers of forest visitors and the increase in numbers of forest fires or in deaths due to water-borne diseases. The very conditions which have promoted the growth in recreational use have facilitated the control of its increased hazards in equal or perhaps even greater degree, consequently the net result has not been seriously adverse.

It is, of course, evident that the promiscuous diffusion of millions of people throughout the National Forests inevitably would mean tremendous increases in numbers of fires and serious pollution of sources of domestic water supply. As an alternative to prohibitory regulations the improved campground at once suggests itself as a potent means of securing voluntary concentration conducive to effective control. Comfort and convenience are lures which few visitors can resist. The problem has been approached from this angle and out of a total of approximately 1,500 National Forest campgrounds, 1,187 have been at least partially equipped with the facilities most essential to public health, safety and convenience. If present appropriations are continued for a few more years, the ready availability of an adequate system of convenient campgrounds open to free public use will largely minimize the risk inherent in the widespread use of forest lands for summer recreational purposes.

As time has gone on the cultural influence of the forest has manifested itself in many striking ways. The noisy, inconsiderate barbarian, purposely scornful of the tenets of neatness, sanitation and fire protection, is still evident but proportionately less so than in earlier years, and usually he is the novice, the amateur in woodcraft and nature study, the person whose liberty and means are still so new that he has not learned how to use them. To the more experienced, the forest displays new possibilities and purposes which intrigue the soul and inspire a real consideration of all the elements of nature. Such people demand, and personally conform to, new standards of nature esthetics; realize that the beauties of a forest cannot be plumbed by swift and noisy movement from point to point, or by hasty and superficial sampling of only the most obvious and inescapable elements, and desire means whereby they can tarry and seek out the true spirit of the forest.

To provide for this class carefully planned summer-home communities have been developed. There is many an odd nook and corner within the National Forests in which anywhere from a dozen to a gross of summer homes can be established with little or no conflict with other forest uses. By careful planning each home can be given a satisfactory degree of detachment and seclusion; by quiet insistence on reasonable standards of arrangement, exterior design, color schemes, lot maintenance and sanitation the natural values of the environment can be maintained. With an annual land rental of ten to twenty-five dollars a year, and a capital investment of from $250 to $2,500 many a man of moderate means now finds it possible to furnish his family with an almost ideal summer home, near enough to permit him to spend all week-ends with them throughout the summer. At the close of 1929, 10,347 summer-home permits were in effect.

Then, too, there are the summer camps, some operated by municipalities on practically a cost basis, many by organizations such as the Boy Scouts, the Girl Scouts, others by religious or fraternal groups, and still others as strictly commercial enterprises. These have grown surprisingly, both in number, in architectural standards and in the quality of service furnished. Supplementing them are some real resorts and hotels, one representing an investment of $350,000, almost entirely of local capital. At the close of 1929 there were 1,109 summer-camp, resort and hotel permits outstanding. Because of the new importance of the recreational areas, the new quality standards governing their development, the old haphazard and unsystematic methods of granting permits have been succeeded by programs of careful planning, through which the highest values of each area can best be realized. Mistakes still are made, but each year marks an advance in the technique of coordinated planwise use and the infinite possibilities for use afforded by the National Forests will not be impaired through poorly conceived or executed modifications.

To a rapidly growing group all of this change, which is generally regarded as progress, is a matter of grave concern. They cannot avoid a feeling of apprehension as they note the steady extension of new roads into areas hitherto accessible only to those who possessed the strength of body and courage of heart to meet and overcome the challenges of nature and the steady multiplication of the evidences of man's present culture. And there is merit in their viewpoint. The obliteration of the last vestiges of primitive America, or the last examples of the conditions under which our forefathers struggled to create a nation, would be calamitous. If it is within the province of the Forest Service to prevent it, this will never happen. For the past year a study has been under way to determine and define the best remaining examples of the primitive in nature within the National Forests, and to initiate steps to safeguard from any and all forms of unnecessary modernization such of the areas as are of outstanding character.

Patrolling the Forest Hinterland

By A. C. McCain

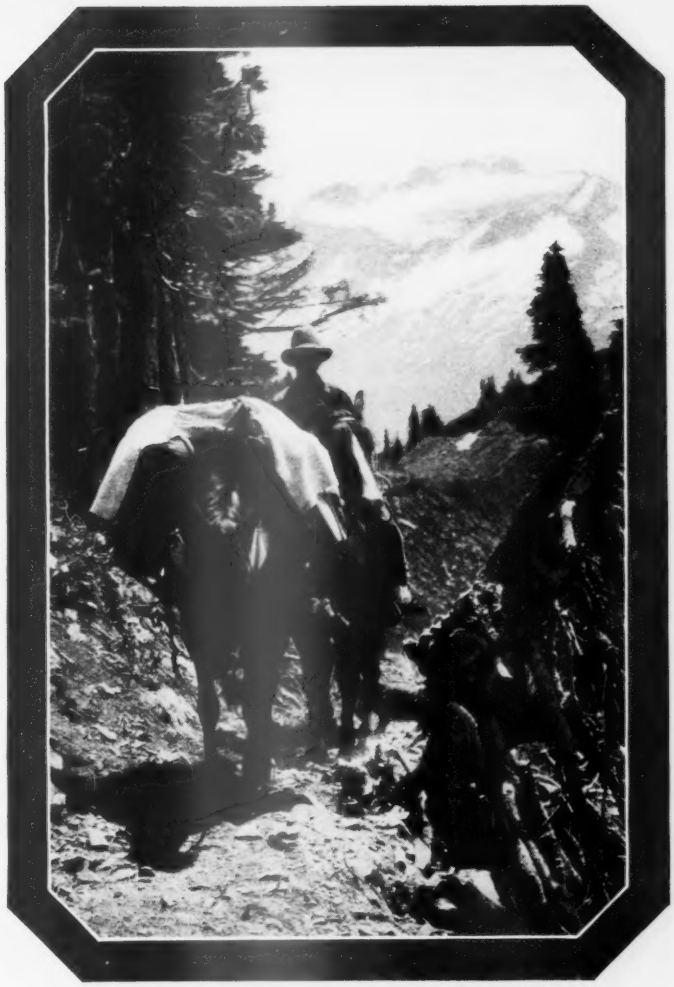


Photo by Asahel Curtis

The solitary Forest Ranger—untiring guardian of the forest hinterland

A HALF-MILLION acres of rugged land set astride the Continental Divide, unchanged in the general aspect of primitiveness since the days of the early explorers and fur traders, clothed with virgin stands of timber, interspersed with open valleys, ablaze with a wealth of flowering shrubs and plants. A vast region of sublime primitiveness and solitude, without human habitation and hardly a sign of human visitation. On the high ridges vast bands of elk, among the crags and cliffs the stately mountain sheep, in the mountain meadows and swamps the ungainly moose, on the hillsides the graceful deer, and among the patches of huckleberry and chokecherry the bear. In the streams and lakes the elusive trout and the industrious beaver.

Such, in brief, might have been a very superficial description of this area, now part of the Teton National Forest, in Wyoming, in 1807 when John Colter first viewed it. And such it remains today, due, in a great measure, to the untiring vigilance and sustained effort of a solitary forest ranger, whose assignment began more than twenty-five years ago and continued in one unbroken period of service until 1928, when he was compelled to retire because of physical disabilities incurred in the line of duty.

The individual members of fire-fighting crews are buoyed up and encouraged in moments of extreme peril and hardship by the presence of their fellow officers, but not so the solitary ranger, whose duty sends him into the back country to combat single-handed all the forces of nature and where a single mistake or mishap, even though trivial, may and often does entail severe hardship and suffering and sometimes death. The archives of the Teton National Forest contain records all too brief, of the exploits of the solitary patrolman of this district, performed as a matter of course and without a thought beyond that of routine duty.

The written history of these exploits are entries in individual official diaries so brief that only the initiated would suspect their significance. What casual reader of these diaries would suspect that he was reading the day by day history of an impending tragedy in such formal diary entries as these—"snowed all day, traveled fifteen miles, laid out under a big spruce—" or "had trouble with my eyes from snow-glare—" or the less frequent entry, "snow slides running all the way through the canyon." Knowing the sequel to this forest officer's story, so briefly set down in his official diary, we know that traveling fifteen miles on skiis in a snowstorm and lying out under a spruce tree meant heart-breaking physical effort and complete physical exhaustion—and that trouble with his eyes meant that he suffered the excruciating agony of snowblindness and that when the snowslides were running all the way down the canyon that he was in extreme peril of his life all day long. We know now that the constant repetition over a period of more than twenty years of complete physical exhaustion, the constant mental strain of impending danger which he faced alone, and the constant eye strain finally resulted in a malady which left him hopelessly blind while yet in the prime of life, rendering him unable to contemplate and enjoy ever again the glorious work of creation which he so dearly loved and zealously guarded.

To quote again, but this time from a diary dated as recently as November, 1929, "I accidentally cut my arm while cutting a small rope." The sequel to this brief account of

an apparently trivial accident is to be found in the verdict of the coroner's jury, "Came to his death by knife and gunshot wounds accidentally inflicted by himself." This forest officer, stationed at a lonely station in the back country and particularly charged with the duty of game-law enforcement in a locality infested with poachers, was reported as having failed to keep an appointment with a fellow officer on an adjoining patrol route and immediate search was instituted to ascertain the cause. A heavy fall of snow had obliterated all tracks and signs since he had left his headquarters camp and it was several days before the searchers found him. The diary entry quoted told part of the story but not all. While proceeding to keep his appointment he had apparently stopped to rearrange the load on his pack horse and in cutting a small sling rope with his pocket knife he had accidentally cut his arm on the inside of the elbow, severing large blood vessels and making a wound from which the surgeon who made the post mortem examination said he would inevitably have bled to death in the absence of immediate expert surgical assistance. Apparently realizing the seriousness of his position, he had hastily written the diary entry quoted and then in the act of firing his gun in an effort to attract attention he had, in his weakened condition, accidentally inflicted another fatal wound.

Continuing further in our perusal of old records, the following incidents are gleaned from characteristically brief official diary accounts, and because they happened on a National Forest far removed from the Teton, they suggest that the hazards of a forest ranger's duties in the back country are pretty much the same on all the forests.

The first incident relates to a single-handed battle against a forest fire, in which it seems the result was a sort of a Mexican standoff, the ranger lost the fire but saved his life. The fire was discovered in a locality which could not be reached with pack horses, so with ax and shovel and all the provisions he could pack on his back he set out afoot. Arriving at the fire, in heavy timber in the bottom of a gulch, he realized that should the wind rise unexpectedly there would be considerable danger and the probability of escape would be pretty much a matter of luck at the best. So retracing his steps to the top of the ridge, from which he had just descended and which was rocky and almost bare of vegetation, he deposited his food supplies and an extra receptacle which he had filled with water, and returned to the fire. In the course of time the blaze was trenched and apparently safe under favorable conditions. The ranger then repaired to his improvised camp on the rocky ridge to rest.

But his rest was of short duration. He was awakened by a mighty roar and the glare of a conflagration in his eyes. He saw a wall of flame mounting the side of the mountain at tremendous speed. Not knowing where or when the avalanche of fire might be launched up the mountain side, the ranger hurriedly gathered his scanty equipment and provisions and raced along the top of the ridge to a position immediately above the recently burned area. The rocks were hot and the smoke stifling but the situation seemed very comfortable. In less than ten minutes, however, he witnessed the fire hurl itself up the side of the ridge and lap over the top where a few minutes before he had been camped.

The ranger, hardly able to breathe, could not close his eyes to the awe-inspiring panorama of fire and destruction. From his lofty point of vantage the spectacle beggared description. A gigantic wall of fire, whipped on by an ever-increasing wind, would toss a burning firebrand a half-mile ahead and then chase furiously after it, soon overtaking it and tossing it on again. It was not until late the second day, when the pall of smoke had cleared somewhat and it became apparent that the fire had receded, that the ranger dared attempt the trip down the mountain.

If the foregoing incident recounts an experience under the stress of extreme heat, the following, gleaned from the same set of diaries, recounts an incident experienced under the rigors of the other extreme of temperature. The story is covered in a few characteristically formal official diary entries:

"Left camp at 8 A. M., snow getting deeper and drifted. Looks like a storm. Camped at noon, cannot face storm, eyes sore from glare and driving snow. Wish I had my tent.

"Blizzard all night, now clear and cold. Horses unable to rustle during night, fed them all the cold hot cakes that could be made from the remains of a nine-pound sack of corn meal. Left camp at 9:30 A. M., traveled all day until 4 P. M. Eyes in bad shape from snow glare, condition aggravated by smoke and glare from a sagebrush camp fire."

There are no more day-by-day diary entries but the remainder of the story is deduced from one entry made several days after the ranger arrived at his final destination. It appears that the day after the blizzard the weather was clear and somewhat warmer. He didn't sleep much because of pain in his eyes and that he left camp at 8 A. M. Before noon he was unable to see because of excruciating pain whenever his eyes were open and exposed to the light or upon the least movement of the eyelids. By reference to the position of the sun, travel was maintained on a general course, otherwise the horses were left to their own resources. Along in the afternoon the horses persisted in a strong inclination to bear off sharply from the general course and if given their heads would quicken their gait and show very plainly that they wanted to go that way. The ranger finally decided to let them have their head. At the worst the attraction could be a bunch of range horses and at the best a camp or some other human habitation. In the course of a half-hour the horses' judgment was fully confirmed by the sound of a dog barking and in a few minutes more they pulled up in front of the tepee of Iron Pipe, a Blackfoot Indian, where the ranger was welcomed and his eyes treated.

He then resumed his journey and in due course of time and without further incident arrived at his final destination. He learned years afterwards that, at that time, the florid and swollen appearance of his countenance and the bleary condition of his eyes was responsible for first impressions of the office force and a certain district inspector, that he was a confirmed inebriate.

Long periods must elapse in the search for forest facts. Here, at the Wagon Wheel Gap Station in the canyon of the Rio Grande, two small watersheds were studied for sixteen years to determine certain effects of the forest upon streamflow and erosion

The Search for Forest Facts

By Raphael Zon

FROM a neglected, starved, and scorned stepchild in 1905 to one of the most respected offspring in 1930, such was the meteoric rise of the Research unit in the Forest Service. "There is a reason," as the cereal ads would put it. Like all things worth while, research was born of necessity. Even in the pre-National Forest days, there was a need for some unit where technical facts and forest statistics could be assembled and made available when a speech was to be made, a letter on a technical subject answered, or a statement prepared for the use of the Secretary or of Congress. The little dark room on the sixth floor of the Atlantic Building, Forest Service headquarters at Washington, D. C., dubbed "Compilation," was the first treasure-house of our technical knowledge and the cradle of Forest Research in this country.

The years that immediately followed the transfer of the National Forests was the storm-and-stress period of the Forest Service. One big development followed another almost every day, with scarcely time in which to organize the new trenches wrested from the opponents of conservation before another battle was on. The best talent and energy were diverted to blocking out the boundaries of the National Forests, recruiting personnel, formulating general policies of timber sales, grazing, land classification, and the similar problems that go with the administration of a vast domain.

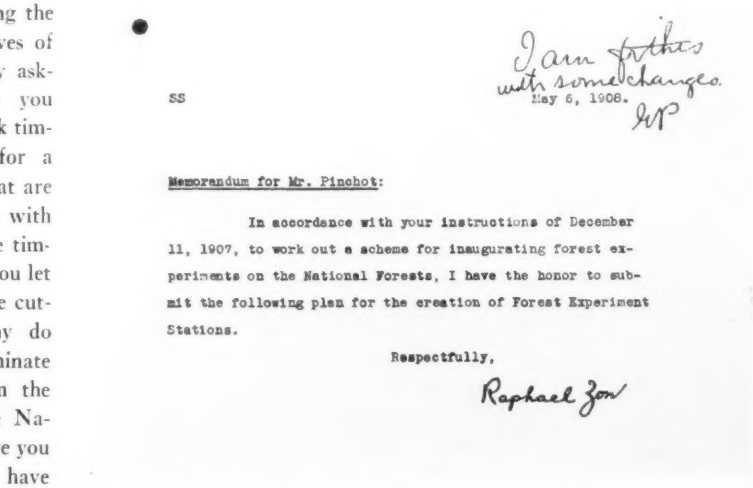
The West had to be won over to the conservation policies of the Service. The men who could do it were men of action, men who could make quick decisions and yet not err too much. There was no time for lengthy observations, or searching for forest facts. The respect which the Forest Service commands today in the West, because of its efficiency and fairness in dealing with the problems of the people, bears testimony to the brains, character, and mettle of these early pioneers and the success that they achieved. Forestry was still in an academic stage, however, and had yet to be translated into the practical terms of forest management.

There were a few men scattered here and there who were manifestly "cranks." They did not pride themselves—and in truth had no reason to—in throwing the diamond hitch or riding half-broken bronchos. Their use of profanity was awkward, and a sorrowful sight they made when attempting

to chew tobacco. What these men lacked in "wildness and wooliness," however, was more than made up for by their persistence and utter unreasonableness. Continually asking embarrassing questions, they were the thorn in the flesh of the early administrative men; they were the "gadflies" of the Forest Service. When the early timber sales began on the National Forests, they were always taking the joy out of the lives of the supervisors by asking them: "Do you know how to mark timber to provide for a second cut? What are you going to do with the slash from the timber sales? Will you let sheep graze on the cut-over land? Why do you want to eliminate the foothills from the boundaries of the National Forests? Are you sure they do not have any effect on the flow of the streams in the valleys?"

When the "administrators" in a burst of youthful enthusiasm started to convert chaparral and semidesert—where the Lord himself forbade trees to grow—into what were supposed to be forests of the future, these gadflies bombarded them with questions: "How do you know the trees will grow there? Is there enough moisture? Will they stand competition with the hardy chaparral?" At a time when the timber sales were still infinitely small and could not make the slightest dent upon the accumulated forest growth of centuries, they were talking about "silvicultural systems, sustained yields, working plans, forest growth," and what not. This early questioning may not have been fruitful of great results, but it did show the need for a real knowledge before the National Forests could be handled with the greatest good to the people of this country.

It was more than a coincidence that at the head of the Forest Service at that time was a man whose vision stretched beyond the immediate needs of the moment, who pictured the National Forests not merely as so much locked-up forest land, but as active and producing laboratories of timber for use by the people, not only stored-up reserves of wood but living things whose influence extended far beyond their own boundaries and even affected the whole United States. This man was Gifford Pinchot. He believed that the success or failure of the National Forests would depend upon how well they were handled as growing crops. To him the few cranks who insisted upon more knowledge about our forests and the need for more accurately established facts, were not altogether an unmitigated nuisance. He believed that out of their groping and persistent questioning — at times impractical and foolish—might come the technical knowledge that is the foundation of proper handling of any forest. He saw clearly that after the heroic phase of the conquest of the West was over and the Forest Service settled down to the more prosaic cutting and growing of timber, it would be confronted with a great need for accurate facts upon which to base the management of those resources, and that these facts could not be obtained over night. If February 1, 1905, marks the era of the National Forest administration, then May 6, 1908, when the scheme for



I am for this with some changes.
May 6, 1908.
GP

SS

Memorandum for Mr. Pinchot:

In accordance with your instructions of December 11, 1907, to work out a scheme for inaugurating forest experiments on the National Forests, I have the honor to submit the following plan for the creation of Forest Experiment Stations.

Respectfully,

Raphael Zon

This little memorandum was a potent factor in National Forest history, for it was in reality the Magna Charta creating Forest Experiment Stations.

And, below—where the work had its inception—the first Forest Experiment Station, with its primitive equipment, established on the Coconino National Forest near Flagstaff, Arizona, in the summer of 1908

establishing forest experiment stations on National Forests received Pinchot's characteristic *"I am for this with some changes,"* marks the beginning of forest investigative work in this country.

The purpose of the experiment stations, as stated in the memorandum approved by Gifford Pinchot on May 6, 1908, was "to carry on, on areas segregated from the usual business enterprises (of the National Forests), experiments and studies leading to a full and exact knowledge of American silviculture, to the most economic utilization of the products of the forest, and to a fuller appreciation of the indirect benefits of the forest. Each station should be allowed an area sufficient for the proper handling of short-period experiments, for experiments requiring a number of years, and for the maintenance of model forests typical of the silvicultural region. These areas will furnish the most valuable, instructive, and convincing object lessons for the public in general, for professional foresters, lumbermen, and owners of forest land, and especially for the technical and administrative officers of the National Forests. They should be made the meeting grounds for supervisors, rangers, and guards, where demonstration may be given for the education of these men, and an active interest stimulated in the technical side of the forest work—an interest which could not be engendered by any amount of literary or oratorical effort."

In the summer of 1908, the first forest experiment station was established on the Coconino National Forest, near Flagstaff, Arizona. This was soon followed by experiment stations in the Pikes Peak region in 1909, on the Rio Grande National Forest, in Colorado, in 1910, on the Kaniksu, in Washington, in the fall of 1911, on the Plumas, in California, in 1912, and on the Columbia, in Oregon, in 1913. These were later supplemented by range stations, devoted largely to grazing problems in Utah, Arizona, and New Mexico. Within recent years, regional forest experiment stations have also been established in the northeast, South, Lake States, southern Appalachians, Central States, and Middle Atlantic States. Now there are thirteen, all working on problems connected with best management of the forest and the range. The administrative control of the stations has gone through many vicissitudes, but the principles underlying their establishment and the general scope of their work remain practically the same today as when they were enunciated twenty-two years ago.

In later days on the Coconino—where climatic observations determining the influence of the forest are under way. Three points were selected for this work—in the forest itself—on the edge of the forest, and in the open. The opening, shown here, is half a mile from the edge of the forest

Have the experiment stations justified their existence? The answer is to be found in the part which they have played in the development of our National Forests and in stimulating forest practice throughout the country. Good or bad, the present-day methods of cutting, as they exist on our National Forests, are in a large measure due to the teamwork of the supervisors and the experiment station men.

In Europe the government does its own logging and, therefore, can more freely follow definite silvicultural systems. In this country the Government sells its timber on the stump, and the only control it has over the cutting is through marking the timber offered for sale. It is the "timber marking" or "the marking rules" that are the means of developing our silvicultural systems. In most cases it has had to be a compromise between what is best for the forest and what is practical from the standpoint of the (*Continuing on page* 482)

The crashing and rending of falling timber was terrifying, as the hissing, roaring flames licked the sky

OUT of the underbrush dashed a man—grimy, breathless, hat in hand. At his heels came another. Then a whole crew, all casting fearful glances behind them.

"She's coming! The whole country's afire! Grab your stuff, ranger, and let's get out-a here!" gasped the leader.

This scene, on the afternoon of August 20, 1910, stands out vividly in my memory. The place was a tiny, timbered flat along a small creek in the headwaters of the St. Joe River in Idaho. The little flat, cleared of undergrowth to accommodate our small camp, seemed dwarfed beneath the great pines and spruce. The little stream swirled and gurgled beneath the dense growth and windfall, and feebly lent moisture to the thirsting trees along its banks.

For weeks forest rangers with crews of men had been fighting in a vain endeavor to hold in check the numerous fires which threatened the very heart of the great white-pine belt in the forests of Idaho and Montana. For days an ominous, stifling pall of smoke had hung over the valleys and mountains. Crews of men, silent and grim, worked along the encircling fire trenches. Bear, deer, elk and mountain lions stalked stary-eyed and restless through the camps, their fear of man overcome by a greater terror. Birds, bewildered, hopped about in the thickets, their song subdued, choked by the stifling smoke and oppressive heat. No rain had fallen since May. All vegetation stood crisp and brown, seared and withered by the long drought, as if by blight. The fragrance

of summer flowers had given way to the tang of dead smoke. The withered ferns and grasses were covered by a hoar-frost of gray ashes. Men, red-eyed and sore of lung, panted for a breath of untainted air. The sun rose and set beyond the pall of smoke. All nature seemed tense, unnatural and ominous.

It had taken days to slash a way through the miles of tangled wilderness to our fire, sixty-five miles from a railroad. On August 18, this fire was confined within trenches; all seemed well; a day or two more and all would have been considered safe. Difficulties in transportation developed which necessitated reducing our crew from eighty-five to eighteen men.

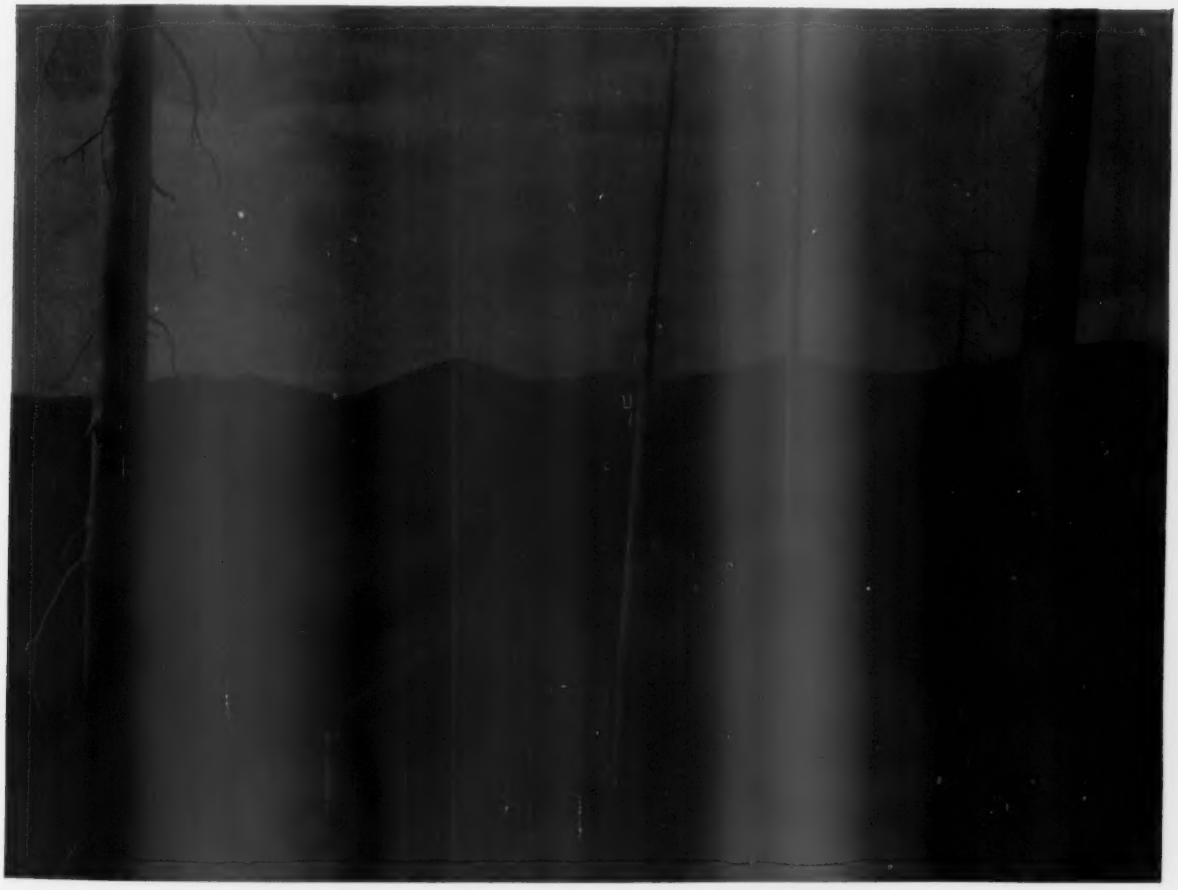
I had just left our two remaining packers with their stock at one of our supply camps and returned, when our demoralized crew dashed in. Incoherently, the men told how the fire had sprung up everywhere about them as they worked. The resinous smoke had become darker, the air even more oppressive and quiet. As if by magic, sparks were fanned to flames which licked the trees into one great conflagration. They had dropped their tools and fled for their lives. A great wall of fire was coming out of the northwest. Even at that moment small, charred twigs came sifting out of the ever-darkening sky. The foreman, still carrying his ax, was the last to arrive. "Looks bad," he said. Together we tried to calm the men. The cook hurried the preparation of an early supper. A slight wind now stirred the treetops overhead; a faint, distant roar was wafted to my ears. The men heard it; a sound as of heavy wind, or a distant waterfall. Three men, believing safety lay in flight, refused to stay. "We're not going to stay here and be roasted alive. We're going."

Things looked bad. Drastic steps were necessary. Supper was forgotten. I slipped into my tent and strapped on my gun. As I stepped out a red glow was already lighting the sky. The men were pointing excitedly to the north.

"She's jumped a mile across the canyon," said the foreman, who had been talking quietly to the men. Stepping before them, I carelessly touched the holster of the gun and delivered an ultimatum with outward confidence, which I by no means felt.

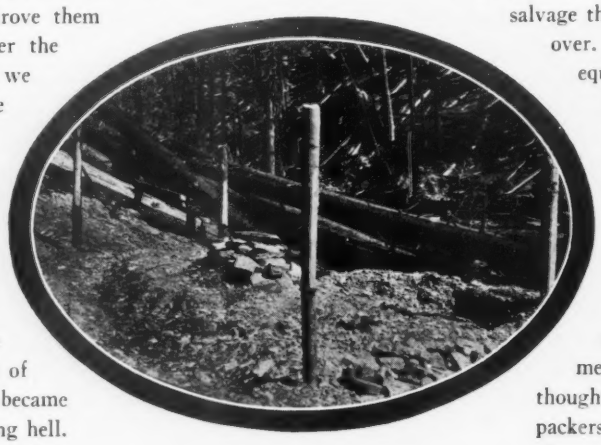
"Not a man leaves this camp. We'll stay by this creek and live to tell about it. I'll see you through. Every man hold out some grub, a blanket, and a tool. Chuck the rest in that tent, drop the poles and bury it."

The men did not hesitate. The supplies, bedding, and equipment were dumped into the tent, the poles jerked out, and sand shoveled over it. Some ran with armloads of



Such a scene! The green, standing forest of yesterday was gone—only a charred and smoking remnant of stripped and broken trees was left, and the hideous red glare of the inferno still lighted everything

canned goods to the small bar in the creek, an open space scarcely thirty feet across. Frying pans, pails, and one blanket for each man were moved there. Meanwhile the wind had risen to hurricane velocity. Fire was now all around us, banners of incandescent flames licked the sky. Showers of large, flaming brands were falling everywhere. The quiet of a few minutes before had become a horrible din. The hissing, roaring flames, the terriffic crashing and rending of falling timber was deafening, terrifying. Men rushed back and forth trying to help. One young giant, crazed with fear, broke and ran. I dashed after him. He came back, wild-eyed, crying, hysterical. The fire had closed in; the heat became intolerable. All our trust and hope was in the little stream and the friendly gravel bar. Some crept beneath wet blankets, but falling snags drove them out. There was yet air over the water. Armed with buckets, we splashed back and forth in the shallow stream throwing water as high as our strength would permit, drenching the burning trees. A great tree crashed across our bar; one man went down, but came up unhurt. A few yards below, a great log jam, an acre or more in extent, the deposit of a cloudburst in years gone by, became a roaring furnace, a threatening hell. If the wind changed, a single blast from this inferno would wipe us out. Our drenched clothing steamed and smoked; still the men fought. Another giant tree crashed, cutting deep into the little bar, blinding and showering us with sparks and spray. But again the men nimbly side-stepped the hideous meteoric monster.



Under this rock cairn the bodies of eleven men who gave their lives fighting fire on the St. Joe were temporarily interred

After what seemed hours, the screaming, hissing, and snapping of millions of doomed trees, and the showers of sparks and burning brands grew less. The fire gradually subsided. Words were spoken. The drenched, begrimed men became more hopeful. Some even sought tobacco in their water-soaked clothing. Another hour and we began to feel the chill of the night. The hideous, red glare of the inferno still lighted everything; trees still fell by the thousands. Wearily, the men began to drag the watersoaked blankets from the creek and dry them; some scraped places beneath the fallen trees where they might crawl with their weary, tortured bodies out of reach of the falling snags. The wind subsided. Through that long night beside a man-made fire, guards sat, a wet blanket around their chilled bodies.

Dawn broke almost clear of smoke, the first in weeks. Men began to crawl stiffly out from their burrows and look about. Such a scene! The green, standing forest of yesterday was gone; in its place a charred and smoking mass of melancholy wreckage. The virgin trees, as far as the eye could see, were broken or down, devoid of a single sprig of green. Miles of trees—sturdy, forest giants—were laid prone. Only the smaller trees stood, stripped and broken. The great log jam still burned. Save for the minor burns and injuries, all were safe. Inwardly, I gave thanks for being alive. A big fellow, a Swede, the one who had refused to stay, slapped me on the back and handed me my gun. I had not missed it.

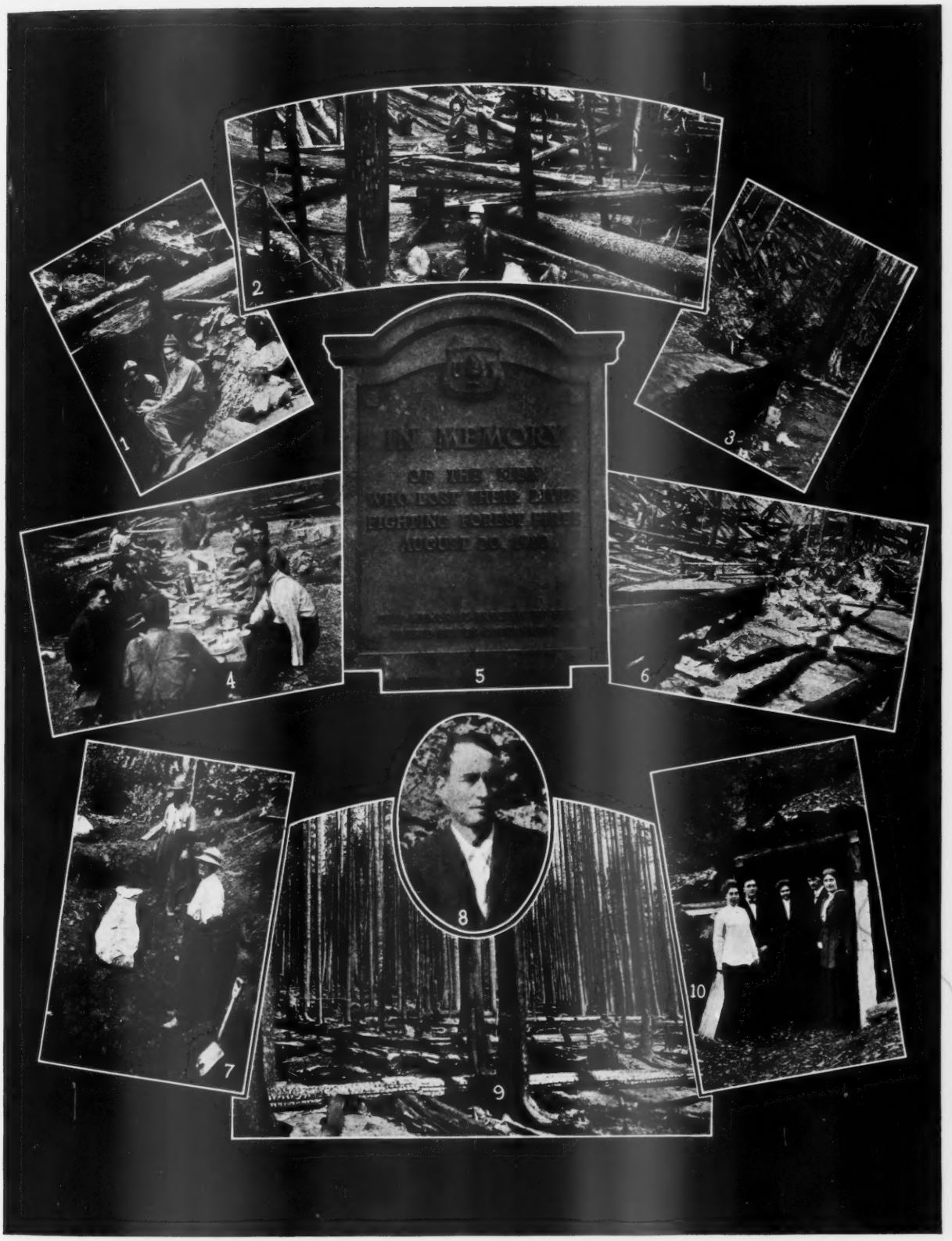
"You lost her in the creek last night. You save me my life," he said, simply. His lip trembled as he walked away.

The cook had already salvaged a breakfast from the trampled cache in the creek. Frying ham and steaming coffee drove away the last trace of discomfort.

"What are your plans?" asked the foreman, after several cups of coffee. "First we'll dig out our tent, salvage the grub, and then look the fire over. We'll order more men and equipment and hit the fire again."

Little did I know as I spoke that our fire that morning was but a dot on the blackened map of Idaho and Montana. After breakfast we picked our way through the fire to our camp of yesterday. All was safe. We moved the remaining equipment to the little bar. Our first thought was for the safety of our two packers and the pack stock at our supply camp. The foreman and I set out through the fire over the route of the old trail now so changed and unnatural. With ever-increasing apprehension we reached the first supply camp where I had left the packers. Only a charred, smoking mass of cans and equipment marked the spot. What had become of the men? Not a sign of life could we find. They must have gone to the next supply camp. We hurried on, unmindful of the choking smoke and our burned shoes. We came upon our last supply camp; this, too, was a charred, smoldering mass. Still no signs of the men. A half mile beyond we suddenly came upon the remains of a pack saddle; then, another; the girths had been cut. Soon we found the blackened remains of a horse. Feverishly we searched farther. Next we found a riding saddle. With sinking heart we hastened on. More horses and more saddles. The fire was growing hotter. We halted, unable to go farther. We must go back for help and return when the heat had subsided.

Smoke darkened the sky; the wind had again risen to a gale; trees were once more falling all about us. We took shelter in a small cave in a rock ledge where the fire had burned itself out. Here we sat, parched, almost blind with smoke and ashes. Once the foreman voiced my thoughts: "The wind will die down toward night, then we can go back to camp." The fury of the wind, however, increased steadily. Fires roared again, and across the canyon trees



That death and destruction ever stalk tragically in the wake of forest fire is proved by these few pictures. (1) At the mouth of the tunnel where Pulaski and his fifty men sought refuge and in which five men died. (2) Slashing through the dead and down timber to open a trail after the fire. (3) This white pine fell and killed three men standing behind the cedar in the background. (4) At the Halm camp on the gravel bar, after the worst was over,—and the heroic men of whom the author writes. (5) Marker on the monument erected by the government at St. Maries, Idaho, at the place of final interment of the fire-fighters. (6) Where Joe Beauchamp's cabin stood before fire swept over it. (7) On Setzer Creek, disinterred bodies being prepared for transportation and burial. (8) Ranger Pulaski who saved the lives of his men by sheer pluck and cool-headedness. (9) Fire-killed timber on Big Creek. (10) The retimbered tunnel where Supervisor Weigle (rear right)— a hero of the fire—nearly lost his life.

fell by the hundreds. After what seemed like hours, we crept out of our cramped quarters and retraced our steps. The storm had subsided slightly. If the remains of trail had been littered that morning, it was completely filled now. We came to a bend in the creek where the trail passed over a sharp hogback. As we neared the top, we again came into the full fury of the wind. Unable to stand, pelted by gravel and brands and blinded by ashes, we crawled across the exposed rocky ledges. I had never before, nor have I since, faced such a gale. On the ridges and slopes every tree was now uprooted and down. We passed the grim remains of the horses and supply camps. In the darkness we worked our way back over and under the blackened, fallen trees. Fanned by the wind the fire still burned fiercely in places. Torn and bleeding we hurried on, hatless — in the darkness, lighted only by the myriads of fires— I picking the way, the foreman watching for falling trees. While passing along a ledge a great tree tottered above us and rent its way to earth, rolling crazily down the slope. We ran for our lives, but the whirling trunk broke and lodged a few feet above. So absorbed were we with our plight that we nearly passed our camp on the little bar in the creek bottom.

The screaming and snapping of millions of doomed trees, and the showers of sparks and burning brands grew less, as the fire gradually subsided

By firelight we ate and related our fears as to the fate of the packers. As we talked, one of the men, pointing to the eastern sky, cried, "Look, she's coming again!" The sky in the east had taken on a hideous, reddish glow which became lighter and lighter. To the nerve-racked men it looked like another great fire bearing down upon us. Silently the men watched the phenomenon which lasted perhaps ten minutes. Then the realization came that the sky was clearing of smoke. In another brief space of time the sun shone. Not until then did I know that it was only 4 o'clock. A change in wind had shifted the smoke toward the northwest. We later found that the burn extended but a mile or two to the south of us.

Daylight next morning found us chopping and sawing a route back through the now cooled burn toward civilization, searching for our packers. That day I visited a prospector's cabin on a small side creek, a mile from the trail, to learn the fate of the man, a cripple. His earth-covered dugout by some miracle had withstood the fire. There were no signs of life about. Whether the man had gone out earlier in the week, or had suffered the same fate as our packers, I did not then know. Evening found our little party many miles from camp. We saw the remains of an elk and several deer; also, a grouse, hopping about with feet and feathers burned off—a pitiful sight. Men who quenched their thirst from small streams immediately became deathly sick. The clear, pure water running through miles of ashes had become a strong, alkaline solution, polluted by dead fish, killed by the lye. Thereafter we drank only spring water. Late that night, weary and silent, the men returned to camp and crept into their blankets. Daylight again found us on the trail equipped with packs of food and blankets. About noon we came upon an old, white horse, one of our pack string, badly singed, but very much alive, foraging in the creek.

Late one day, the sixth since the great fire, a messenger, besmudged and exhausted, reached us. From him we learned that Wallace and many other towns and villages had burned; that at least a hundred men had lost their lives and that scores were still missing. He had seen many of the dead brought in. Our crew had been given up as lost. Several parties were still endeavoring to reach us from different points. Ranger Haines with his crew was then several miles back and would cut the trail to take us out. Our packers, he said, had reached safety. The crippled prospector was still among the missing, and we were to search for him. For three days we combed the burned mountains and creeks for the missing man. On the third afternoon, weary and discouraged, we stumbled upon the ghastly remains, burned beyond recognition. His glasses and cane, which we found near, told the mute story of the last, great struggle of the unfortunate man, who, had he but known it, would have been safe in his little shack. In a blanket we bore the shapeless thing out to the relief crew.

From Ranger Haines I heard the story of our packers. Shortly after I had left them they had become alarmed. Hastily saddling the fourteen head of horses, they had left the supply camp for Iron Mountain, sixty miles away. Before a mile was covered they realized the fire was coming and that, encumbered with the slow-moving stock, escape would be impossible. They cut the girths and freed the horses, hoping they might follow. Taking a gentle, little saddle mare between them, they fled for their lives; one ahead, the other holding the animal by the tail, switching her along. The fire was already roaring behind. (*Continuing on page* 479)

"Old-Timer"

Jacinto D. Reyes, Veteran Ranger, Who Has Served Continuously for Thirty Years

By William V. Mendenhall

IN THE southwestern corner of the San Joaquin Valley, in California, where the desert meets the forested slopes of the San Rafael Mountains, lies the Cuyama ranger district of the Santa Barbara National Forest. Within this area spreads the Cuyama Valley and practically the entire drainage area of the Cuyama River.

It was into this country in 1854 that Rafael Reyes drove 2,000 head of cattle and 1,000 head of horses in search of feed. It was there he settled, making his cow camp in the head of the Cuyama, at what is now known as the Ozena Ranch. His nearest base of supplies was Ventura, thirty miles by trail over the San Rafael Mountains.

Mr. Reyes was married sixteen years after he settled in the Cuyama and in 1871 Jacinto D. Reyes was born—Jacinto, who today is the oldest forest ranger in point of service, having worn the shield of the government continuously for thirty years. After he finished school Jacinto lived at the ranch in the Cuyama and assisted in the cattle business. He learned the entire country from the cattleman's viewpoint before the Forest Service was established. In 1900, when the Forest Reserves were administered by the Department of the Interior, he went to work as a ranger for Supervisor Slosson, and since then has been in continuous charge of the Cuyama district.

Jacinto D. Reyes
Dean of Uncle Sam's forest rangers

During his early period of service many of the later-day men of prominence in the Forest Service visited the Cuyama district as cubs and profited by their experiences with Jacinto on the open range. Among them were W. B. Greeley, Will C. Barnes, A. W. Sampson and P. T. Harris. On one of these trips, Jacinto relates, Barnes, on leaving the Snedden Ranch with only six miles to go to the San Emigdio Ranch, indicated his fear that they would arrive too early to be invited to dinner and suggested that they make the trip in a roundabout manner so as to arrive there just in time to get their names in the pot. He claims that Greeley still owes him a pair of socks on a bet that was placed on the amount of timber being scaled.

The veteran ranger tells of entertaining President McKinley and President Roosevelt on their visits to California. "In 1901," he said, "President McKinley visited Ventura, and all of the rangers were called in. We were also introduced to Secretary Hitchcock of the Department of the Interior and to Secretary James Wilson of the Department of Agriculture. In May, 1905, President Roosevelt visited Santa Barbara, and we were again called in. We escorted the President in the parade, and I had the privilege of riding on the right side of the President's carriage.

"We were in town amid the pomp and ceremony, but we did not have to wear evening clothes. The rangers appeared on all occasions in double-breasted blue flannel shirts and corduroy trousers."

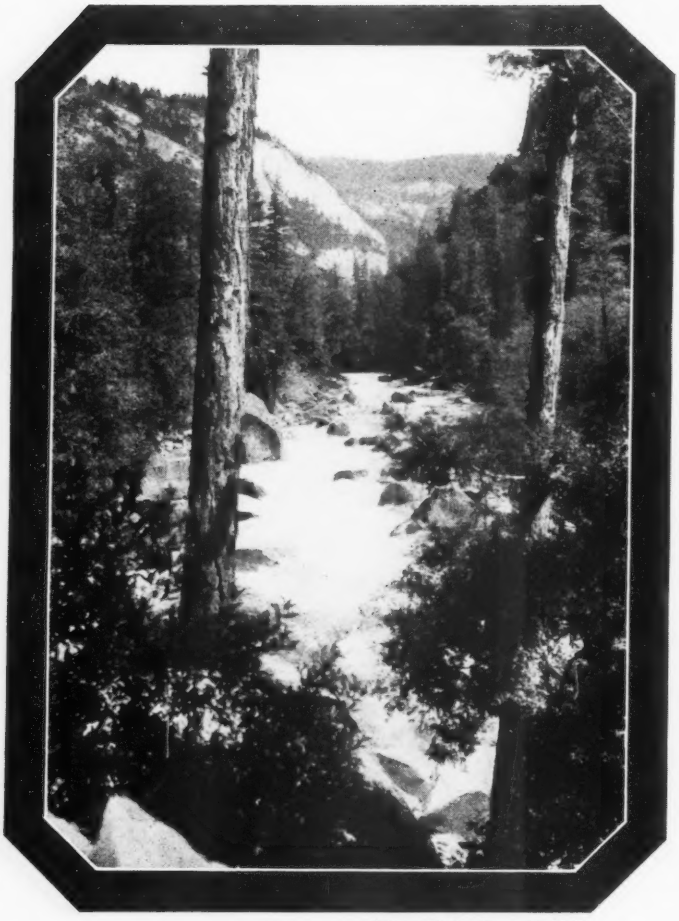
The conditions surrounding the Cuyama ranger district required that Reyes be more self-resourceful than is usually necessary on the average ranger district. His splendid record illustrates the excellence of his judgment and the public with whom he has had to deal have evidenced absolute respect both for him and the organization which he represents.

Jacinto has taken an active part in practically all of the serious fires which have occurred on the Santa Barbara Forest. He had a very important and active part in the Matilija-Wheeler fire of 1917, during which many houses were burned in the Ojai Valley, and in the Kelley Canyon fire of 1922 and the Tujunga fire in 1919—each of these fires burning over an area close to 100,000 acres. In 1921 he had thirty-five consecutive days of actual fire-fighting and in 1922 thirty days.

Living in this environment for forty years has made Reyes a type that is not common in our present-day civilization. He has gone through his share of hardships and come out with a smile. His kindness to animals as well as people indicates the trend of his nature. He has a pack mule, still in active service, that he has owned since 1907, and his thoughts when out in the woods are just as keen for the comfort of his stock as for himself. On many occasions, in order to protect his stock, it has been necessary for him to expose himself to danger, and this he has invariably done without hesitancy.

The "Wild" in Wilderness

By J. W. Nelson



Photograph by George D. Pratt.

In the wilderness of the High Sierras—much the same today as when Kit Carson roamed it

THE standards in wilderness, as in other things, have changed with the times. The wilderness of yesterday is not the wilderness of today. The old-timer and the 20th Century enthusiast in thinking of wilderness have in mind, no doubt, areas remotely located, difficult of travel and undespoiled by the hand of man; while what the average citizen wants are areas with an abundance of game and fish in every stream, and easy of access for rapid transportation. Alas, you cannot have your cake and eat it too. Twenty-five years ago there were wilderness areas in abundance but these have now passed to the vanishing point.

Perhaps what has occurred can best be illustrated by describing a definite area. I know of no better region for this than the North Fork of the Shoshone River—commonly called the Stinking Water—in the Shoshone National Forest, in Wyoming. Thirty years ago this river could be reached only on horseback, or on foot over a poor trail. The North Fork was considered one of the best hunting fields in the State, and with its numerous tributary creeks, it teemed with native rainbow trout. This area was visited annually by many non-resident big-game hunters in addition to a large number of local sportsmen. Following the construction of a good wagon road up the river in 1904 the game disappeared and the streams were fished to such an extent that artificial re-stocking had to be resorted to. The old river road has since been developed into an excellent automobile highway and is one of the principal entrances to the Yellowstone National Park. It is difficult for one to visualize this region, where hundreds of thousands of tourists annually skim over this road in high-powered automobiles and motor busses, as a former wilderness.

Jackson's Hole is another nearby area that is illustrative of the passing of the wilderness. My first trip into this country was in 1897. Being in quest of elk we moved over into the Two Ocean Pass country on the Continental Divide. Here we were surprised to find that we were in the direct line of migration of the southern elk herd from its summer to winter feeding grounds. More than 5,000 elk passed our camp in a period of three days.

While part of this wilderness has given way to the advancement of civilization and economic development, by far the larger part of it remains as it was thirty years ago, and it is probable there will not be any great change in this region during the next half century.

Although California has been overrun with prospectors for over three-quarters of a century it still contains probably the largest single wilderness to be found in the United States. Much of the high mountain range, commonly referred to as the "High Sierras," remains undespoiled. Few areas in this or any other country have been visited by more people. The area includes a large part of the Sierra Nevada Range which extends into seven National Forests and two National Parks and contains many mountain peaks well over fourteen thousand feet in elevation. It has hundreds of lakes and innumerable rivers and streams teeming with fish of many species.

The area has sufficient diversification to meet the desires of the most fastidious wilderness traveler, while the hiker who wishes to carry his entire equipment on his back will likewise not be disappointed. Trip after trip can be made into this area without covering the same country or trail twice.

One meets many interesting people in traveling the High Sierras. For instance, a few years ago I spent two weeks with a party including a ranking member of Congress, the president of a transcontinental railroad, a former president of

an important western university, and a New York sportsman. There were also foresters, rangers, packers and horse wranglers. The party started with pack train from the Yosemite National Park and covered some of the wildest country in the park and the Sierra National Forest. This was traveling de luxe as we had every kind of provision the market afforded and the latest inventions of camp equipment. Camps had to be selected with a view to their esthetic surroundings in addition to being near wood, water and forage for the large cavalcade. While on this trip we met three young ladies who were on a month's hiking trip through this country. They had two burros which packed their camping equipment. The girls showed every indication of enjoying their outing.

On another trip I met a noted Chicago physician who, with his wife and two children, were on a month's fishing trip. It required thirty head of pack mules to carry their supplies and camp equipment. A few days later I met a college professor who, with wife and three children, was also enjoying a vacation. Their camp equipment was transported on the backs of three burros which had to be pushed, pulled and persuaded every step of the way. It is needless to say there were no folding tables or bath tubs with this party, but they were really getting more enjoyment out of their trip than the doctor's party.

I have met few hikers in the Sierra wilderness who depended on their own efforts in transporting their camp necessities. Outing and hiking clubs always provide pack trains to transport camp equipment.

For some unknown reason it seems to be the prevailing idea among outdoor enthusiasts that an area to be a wilderness must be devoid of even the meager refinements that naturally follow civilization. Omar Khayyam had such an area in mind when he wrote:

"A Book of Verses underneath the Bough,
A Jug of Wine, a Loaf of Bread—and Thou
Beside me singing in the Wilderness—
Oh, Wilderness were Paradise enow!"

These were the wilderness ideas of the 11th Century, but it will be noted that wise Omar did not overlook some of the pleasures of his day to make his wilderness a paradise.

Wilderness areas must be fairly accessible if they are to serve their purpose. The public no longer has the inclination to spend countless hours on a poor trail. Many will contend that this position is not consistent, that you cannot have comfortable transportation and at the same time a wilderness. Most of those holding this view are at least in agreement on one thing, namely, that the automobile must be excluded. This is much like the argument advanced a few years ago when National Parks were first opened to automobile travel. Many of the opponents' predictions at that time have failed to materialize and certainly the automobile has made it possible for a much greater number of people to enjoy the nation's wonderlands. Nor will the breaking down of wilderness barriers stop here. It is now possible to leave San Francisco in the morning by airplane for the High Sierra wilderness, catch the limit of golden trout and return home in time to have a fish dinner. But the High Sierras are still wilderness much the same as in the days of Kit Carson.

Association Calls Upon Tobacco Companies to Help Curb Forest Fires

Declaring that the manufacturers and distributors of cigarettes and tobacco can no longer ignore a public obligation growing out of the increasing forest-fire hazard created by their product, in that this hazard has reached a stage which curtails the life and liberty of the people of the nation, George D. Pratt, President of The American Forestry Association, early in June called upon tobacco companies to participate more fully and aggressively in the national campaign to prevent forest fires. Mr. Pratt's letter, in full, follows:

"During the past several weeks, the East has experienced the worst forest fires of record. More than a million acres of land have been burned over, human lives have been lost, private property destroyed, and incalculable damage sustained by towns, counties, states, and the nation as a whole.

"In a number of states the fire situation has made it necessary to close hunting and fishing seasons and to restrict the free entry of the public into the woods. And this at a time of year when the American public most needs and desires to partake of the pleasures, health, and inspirational values of the outdoors. It has, therefore, been brought forcibly home that the forest-fire evil has reached a stage which curtails the life and liberty of our people.

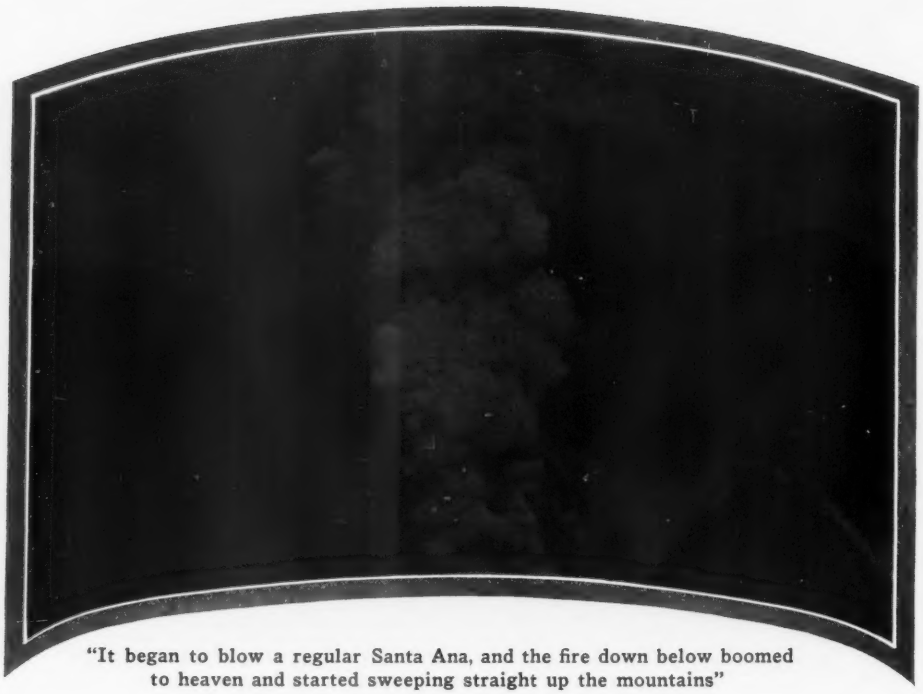
"I have just been reviewing fire reports from the different states, and I am impressed by the fact that the predominant cause of these fires is traceable to cigarette and pipe smokers, particularly the former. In some of the states the authorities report as high as fifty per cent of the fires due to cigarette smokers.

"The federal government, the states, and many private owners are spending in the aggregate millions of dollars in an effort to stop forest fires and to give our outdoor heritage adequate protection. Expenditures by the federal and state governments are derived from taxes and, therefore, represent a participating effort by the public as a whole.

"It appears to me that the time has come when the manufacturers and distributors of cigarettes and tobacco should fully meet a public obligation that they can no longer ignore. Their product is one that public welfare demands be used with care and caution. They are spending huge sums annually to advertise their products and to extend their use. The resulting increase in the number of smokers has naturally made for an increase in the forest-fire hazard—a hazard that has become highly destructive to public interests. I would not be understood as holding that a tobacco company is responsible for the acts of its patrons, but I do hold that by the record of forest fires started by smokers the public may rightfully demand that the tobacco companies do all within their power to warn smokers of the danger attendant upon the use of tobacco in the woods and on the open highways and to instil in them an intelligent sense of public responsibility.

"There are numerous ways by which the foregoing can be accomplished, including the use of slogans such as 'Be sure your cigarette is out before it is thrown away,' which could be printed on your packages and in some of your advertisements. It has occurred to me that The American Forestry Association might cooperate in the selection of the best possible slogan by holding a nation-wide slogan contest among cigarette smokers. This in itself would have high educational value in bringing home to the smokers the need of care with tobacco in the woods. How does this suggestion appeal to you?

"I am not fully informed as to the extent, if any, to which your company is participating in the nation-wide effort to curb the forest-fire menace. My observation is that the tobacco companies are not making a serious or whole-hearted effort to measure up to a public responsibility that is inherently theirs. In order that we may be fully informed, I will greatly appreciate a statement from you indicating what your company is doing either through your advertisements or otherwise to impress upon the users of your product the urgent need of precautionary use of tobacco in the woods and the open country."



"It began to blow a regular Santa Ana, and the fire down below boomed to heaven and started sweeping straight up the mountains"

Singed, but Safe

A "Ranger Bill" Story

By Wallace Hutchinson

"WAKE me for breakfast 'bout day after tomorrow, and I hope she rains for a month!" said Ranger Bill, throwing his dripping Stetson into the corner as he slouched down in an easy chair with a grunt of satisfaction and stuck his wet feet in front of the open fire.

"Have some coffee, Bill. You look fagged out."

"Coffee! You bet, and make her plenty and strong. Man, but this has sure been some strenuous fire season, I'll tell the sun-scorched West! I haven't had a decent night's sleep for months and there's a heap more rangers I know that's been in the same fix. Darned if I wouldn't like to have had some of them city fellows that think a ranger's job's a cinch trail me this summer. Here me and Buck, my pony, has been fighting fires most all season in these mountains, and then to add to my vacation pleasures, so to speak, the Chief up and sends me out to California to help corral a whale of a blaze in one of them brush-forests."

"You must have seen a heap of bad fires," exclaimed the forest guard.

"Fires!" said Ranger Bill, slowly rolling a cigarette. "Why, pardner, I've been in so many fires this summer that I wouldn't be afraid to die tomorrow. Big blazes, too, that swept the mountains as clean as Pete here licks his grub pan when I feed him pork chops. A thousand acres, ten thousand, fifty thousand—all gone up in smoke, just because some fool was careless with a match or cigarette. They ought to cut out the fines and give some of those devil-may-care fellows a shift on the fire line with a long-handled shovel.

"Say, did you ever help cut a fire line through the brush and timber along a steep slope on a red-hot day, with the flames sweeping up the mountainside toward you like a wild tornado? Two thousand men we had on a fire like that this summer. Bleary-eyed men, hacking, digging, sweating under a blood-red sun. Exhausted men, with smoke-filled lungs, parched throats and weary muscles, fighting on, foot by foot, through the brush."

"Fire-fighting must be dangerous work!" I remarked.

"Dangerous work? You said it!" replied the ranger. "The Forest Service had more'n a dozen men killed on the fire line this summer, and I don't know how many hundred were treated for broken legs and cuts and burns, to say nothing of that pesky, itching poison oak. I came mighty near getting mine, too. Fact is, there was one day when I'd have traded all the pay checks I ever hope to get from Uncle Sam for a good, deep breath of mountain ozone. I came out of it all right; but, man, I'm telling you, I sure got the singeing of my life."

"I never heard that story, Ranger Bill."

"No, I ain't never said much about it, but if you're interested—well, this is the way it all happened:

"I was out scouting one afternoon on that big fire in California that had been running plumb *loco* in the chaparral in some of the roughest country I know of. We'd been fighting the ornery critter for more'n three weeks and had a couple

of thousand men and a big bunch of fire camps strung all over the mountains. It would run so fast each day before the wind that we had one heck of a time keeping track of its wanderings so as to know where to hit it the hardest when it died down at night. The brush was so thick that traveling anywhere but along the trails or fire-breaks was a fierce proposition, and I ain't never been able to figure out yet how many shirts and pants the boys left hanging on the scrub oak and chamisal.

"That day I'm telling you about, I had a young fellow, who was a straw-boss in our camp, out with me on the scouting trip. Everything was looking pretty quiet on our side of the fire, so I sent him into Box Canyon to hunt for water, which was getting mighty scarce at camp, while I went up along the ridge to inspect a new piece of fire-break the boys were cutting—promising to meet him later at the head of the canyon.

"About fifteen or twenty minutes after the straw-boss left me, I noticed that the wind was perking up a bit. Then, almost before I knew it, it began to blow a regular Santa Ana, and the fire down below boomed to heaven and started sweeping straight up the mountain-side toward Box Canyon. I was beating it up the trail as fast as my blistered feet and game knee would carry me to warn the fire-break crew to make tracks for an old burn nearby, when suddenly I thought of the fellow I'd sent down into the canyon. I figured he'd be fighting his way through the brush along the creek and wouldn't see the fire coming. So down into the canyon I went, crawling and sliding. When I hit the creek my heart almost stopped beating—she was dry as a bone!

"Up the canyon I fought my way. I didn't dare to give up or stop to rest, for I could hear the fire roaring down below. I knew it was slowly overtaking me from the feel of the hot drafts of air. But it was too late to try and get back to the trail, and there was that man up the gulch—so I kept agoing and fighting all the harder, and then, all of a sudden, I stumbled onto a pool of water.

"Can you imagine what that meant to me? One moment nothing but death staring me in the face, and then—a refuge—a chance for life. The pool wasn't more than a few feet across and about three feet deep, but it looked as big as the Pacific Ocean to me right then. I soused in it until I was soaked to the skin from head to foot, and I was busy clearing away the brush hanging over the pool when the fire came blazing up.

"A thousand acres, ten thousand, fifty thousand—all gone up in smoke, just because some fool was careless with a match or cigarette"

"Down into the water I went, clear under, and held my breath. The flames roared and swirled over and around me in an inferno. Burning branches fell sizzling into the water. Finally, I couldn't hold my breath any longer—I had to come up for air. I stuck my face above the water, pressed my wet bandana tightly over my nose and mouth and tried to sneak a few short gasps, but there was nothing but gas and flames.

"After that I don't remember much—only that I could hear the fire roaring as it swept up the canyon. At last I came to, pulled myself together and somehow staggered into camp. The straw-boss? Oh, he got out all right—saw the fire coming, so beat it for the burned-over area.

"But you can bet your last cigarette paper I won't ever forget the time I spent in that pool. You can call it Providence or anything you like, but I'm telling you straight, for I looked the country all over afterwards—that pool was the only bit of water in the whole of Box Canyon."

EDITORIAL

What Price Ability?

TO THE National Forests—America's greatest achievement in conservation—this issue of AMERICAN FORESTS AND FOREST LIFE is dedicated in commemoration of twenty-five years of significant administration and development. Created for the use and enjoyment of all the people, these public forests today stand, an inspiring institution of democratic government, the realized dreams of free-born men who saw in nature not a reservoir of wealth to be exploited for private gain but a storehouse to be perpetuated and used by all the people.

Fernow, Hough, Pinchot, and the fighting Roosevelt, each contributed in his own way to the molding of the National Forest system. They were held up as conservation visionaries, dreamers and impractical men. We know better today. The great experiment, thanks to the indomitable spirit of Roosevelt and the organizing leadership of Gifford Pinchot, has been made and tested in the crucible of a quarter century of public service. Despite the "free-booters" of old, the American people have and hold today 160,000,000 acres of far-flung forests dedicated to the common welfare.

These forests embrace an area three and one-half times the size of the New England States. What an empire! And what a monument to the commonweal. It is hoped that through the pages of this issue the American people may better glimpse and appreciate the vast and imposing worth of their own great Forests so rich in trees, wildlife and natural beauty. It is particularly to be hoped that the reader will recognize with pride and appreciation the work of the men and women whose lives have been devoted to the making and building of this great forest system. The leadership of men like Pinchot and Roosevelt made the experiment possible; the rank and file of the Forest Service—the rangers, the fire-fighters, the forest supervisors, the technical and administrative staffs—have really made the National Forests what they are today. Devoted to public service under conditions new, untried, and fraught with hardships, these men—and their wives, too—have brought the National Forests through tempestuous experimental days to a successful reality.

The American people may well feel pride in the high character of their public servants who have ably and successfully brought the National Forests through their first twenty-five years. More important still is the attitude of watchfulness which the American public must and is rapidly coming to assume to see that its public servants charged with large responsibilities are adequately compensated. The days of the old spoils system of political, federal office-holding are pretty well over. Congress passed in 1923 a law creating a Personnel Classification Board to determine fair rates of compensation for Civil Service employees. This classification is now going on and has been carried through for employees in Washington. For Forest Service employees outside of Washington, known as the field service, adjusted rates of compensation have not been agreed upon, and it is reported that the tentative classification of the Forest Service field personnel by the Board does not promise rates of compensation comparable to those proposed for workers in other branches performing work of equal or less importance.

There is an immediate danger, therefore, that the field force of the Forest Service, upon whom the successful administration and development of the National Forests finally rests, will emerge from the classification process without fair recognition of the professional and business ability required to meet the difficult duties imposed upon the field managers of 160,000,000 acres of forest property. No greater blow could be dealt the National Forests. These men have given the public a square deal. It behooves the public to see that they in turn receive a square deal. The work of the classification board must not be delegated to subordinates. The question, "What price ability?" must be answered with a broad-gauged knowledge of responsibilities entailed and with a clear vision of the whole splendid National Forest system.

Uncle Sam—Greatest Forester

By J. A. Fitzwater

The "cat"—thudding along, loaded with logs—is an important factor in present-day lumbering

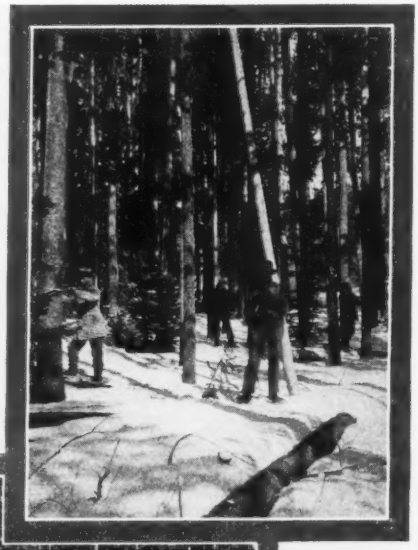
WHEN, as the result of Congressional action in 1905, the National Forests were created, Uncle Sam became sponsor for what was probably the largest forest property of single ownership ever put under regulated forest management. It is doubtful if the Forest Service, selected as the logical bureau to administer this vast property, had any real appreciation of the size of the task or of the importance the National Forests would assume in the lives of the American people.

This great forest property today comprises 149 National Forests—including those in Alaska and Porto Rico—with a total acreage of 159,750,000 acres, of which 85,000,000 acres grow commercial forest crops of sawlogs, ties and poles. In addition there are 20,000,000 acres of woodland and alpine types, which, while they will produce cordwood, posts and other minor products, have their greatest value as a watershed cover in regions subject to the soil-stealing agencies of erosion, and as regulators of stream flow in the high, mountainous regions. Considered in a solid block this forested area of the National Forests represents a tract 405 miles square—equal to the combined areas of the states of New York, Pennsylvania, Ohio and West Virginia. Scattered over thirty-one states and territories and ranging from sea level to elevations of over 10,000 feet and from the tropics to the frozen north, the National Forests embrace about every important forest type found in the North American continent.

Through additions, eliminations, exchanges, and acquisitions the area in National Forests has fluctuated somewhat since the Forest Service first undertook stewardship, but the question of a few million acres would not have changed the complexity of the task it faced. Most of the maps available were very crude and there were practically no reliable timber estimates. The exterior boundaries of the forest were in most cases vague and interior boundaries between private and government timber were entirely lacking.

In conservative lumbering methods developed by the Forest Service, stumps are cut low to avoid waste—brush is piled to be burned under right conditions and young trees are left to insure a future crop of timber. This is on the Black Hills National Forest in South Dakota

When the National Forests were first placed under administration there was naturally much opposition to be overcome. Settlers had been accustomed to take wood from the forest in any form needed and from the most convenient sources. Enterprising gentlemen loggers did a flourishing sawmill business, obtaining their timber from what prior to the creation of the National Forests had been unreserved public land. Many tie operators had large contracts with the railroads and, under the guise of cutting the timber from the adjacent land included in the railroad grants, had extended their operations miles back into what was now within the boundaries of the National Forests. It was naturally difficult for these operators to enthuse over the change in the status of the forest lands and to appreciate the justice of being required to pay a reasonable stumpage and to comply with certain regulatory measures.



Ties being inspected and marked by rangers before being sent out from the Wyoming National Forest in Wyoming

Above—Uncle Sam's foresters cruising timber on the Holy Cross National Forest, in Colorado

Under the old lumbering methods as practiced on private lands and the unreserved Public Domain no thought had been given to future crops of timber. The supply was considered inexhaustible. Good forestry practice could not countenance a continuation of such destructive measures, so the Forest Service had to develop methods of cutting for the different types, which in selection forests would remove the ripe timber and leave a thrifty stand for the next crop, and in mature, even-aged forests would remove most of the crop but leave a sufficient reserve to furnish seed and partial cover for the establishment of new forests. The Forest Service was new, and competent men could not be trained overnight. Men were needed who had had forestry training and who could develop proper systems of marking and estimating, and map timber in advance of sale and cutting, as well as men who had followed woods work and knew how to scale logs accurately and to make timber appraisals. It required a course of training for both contracting parties—operator and administrator—in order that each might know and understand the other's problem. And with the coming of this understanding the relationship has entirely changed. There is now a definite meeting of minds before a timber sale contract is entered into and it is only rarely that serious differences arise.

The Forest Service, as heretofore indicated, needed two types of men for this development—the man who had a first-hand knowledge of logging and milling and who knew what limitations on logging and utilization could reasonably be required of timber purchasers, and the man, who, as the result of his technical forestry training, knew the principles of silviculture, the prescribed methods of regulating the cut to obtain sustained yield and how to conduct the various needed surveys. Forestry schools were comparatively new institutions at this time and there were only a few in the United States. Since there was little opportunity for forest school graduates to enter private work, the Forest Service absorbed practically the entire output. Much recruiting was also done from the lumbering regions of Maine, the Lake States and the Northwest. In these early days the work of forest officers was pretty exacting. Transportation was almost entirely by foot and horseback. Roads in the forest were few and poorly conditioned. Men lived back in the hills months at a time and had very little opportunity for outside social contacts. The work required long hours and a disposition which smiled at grueling hikes through rain and snow, over windfalls and brush. Yet the very nature of the work developed an *esprit de corps* in the Forest Service which has seldom been equaled in any organization and which has had much to do with its success.

The work of developing this timber resource consisted of,

first, the location of the timber, how far it was from market, and how it could best reach the market—by driving the streams, fluming, wagon haul, or railroad. Second, how much timber was available in the different units—whether enough to justify the cost of one of the above improvements. This called for crews to estimate the standing timber and map the topography. It was also necessary to collect information as to the age and characteristics of the timber and prevalence of reproduction, for the purpose of determining proper methods of cutting. With this information available, it was possible to appraise the value of the timber and thereby fix the price of the stumpage.

This procedure had merely to do with the selling of the timber. At first the amount cut was not sufficiently great to raise any question as to overcutting, but as the demand increased it became apparent that if the principle of sustained yield were to be followed it would be necessary to know in advance of offering timber for sale just what the possibilities were of maintaining an annual cut for the manufacturing plants concerned. It emphasized the need of answering the following questions: What timber was tributary to dependent lumber-manufacturing communities, and whether or not there was sufficient timber available to maintain operations until the immature stands and the growth on the areas already cut over would make possible a sustained cut; what areas would probably not reproduce naturally to valuable tree species and would therefore need to be artificially reforested; how the presence of tree diseases and forest insects which might impair or even destroy the forest would affect this particular area; and the degree to which the methods of slash disposal used might affect the fire hazard of the area.

To answer these questions required a staff of highly trained specialists and resulted in the creation of the branch of Forest Research which at the outset was responsible for the development of volume, growth, and yield tables and for studies dealing with the different phases of fire prevention and control. For information and advice as to means of controlling the spread of tree diseases and forest insects the Forest Service called on the Bureau of Plant Industry and the Bureau of Entomology, respectively. With this data available it was possible to formulate plans of management which decided the policy to be followed, determined the sustained annual yield and fixed the sequence of cut.

Naturally the stands which were readily accessible and contained high percentages of the more valuable species were first in demand. Then, as more and more of the privately owned timber was cut out and the private operations approached the National Forests, the less favorably situated government timber could be moved. And so today it is found necessary to have plans of management not only for the more accessible units, but for practically all units containing timber of a merchantable size.

Nursery practice on the National Forests. Lifting and packing young Norway pine seedlings at the Beal Nursery on the Huron National Forest in Michigan.

***Right*—A fine plantation of young Norway pine on the same forest.**

To picture just how a sale of National Forest timber is handled let us assume that a company has applied for the timber in the South Fork of Spotted Elk Creek, White Springs National Forest, which he believes contains 200,000,000 feet of western yellow pine and white fir timber. First the timber has to be estimated. This is done by running strips a chain wide at regular inter- (*Continuing on page* 478)

Our Eastern National Forests

Record Steady Progress in Acquisition Under the Provisions of the Weeks Law

By Philip Ayres

WHAT are the reasons for the purchase of forest land by the federal government in the East? Purchases are being made continuously throughout the Appalachian Mountains from Maine to Mississippi. They affect the daily life and, to some extent, the future prosperity of all citizens. Adequate forests are essential to the permanence of our industries and the health and vigor of our people. A nation dependent upon others for its natural resources cannot remain independent. Italy, without coal, and stripped of forests, affords an illustration.

The eastern portion of the United States is in a position somewhat analogous to that of Italy and other countries devoid of forests. We are not as badly off as others whose civilization is older, but our primeval woods are gone, and our second-growth is far from keeping pace with our consumption. Taking the country as a whole we produce only one-fourth of the timber that we annually consume. There are said to be only six states east of the Mississippi River that produce annually as much timber as they use. The result is that vast quantities of lumber and other essential forest products are imported at great expense into our eastern country from the Pacific Coast through the Panama Canal.

The supply of timber on the Coast, like that formerly in the Appalachian region, is dwindling. The Canadians assure us that they cannot supply the United States from their side of the border for any length of time. Other countries, such as Russia and Brazil, have forests that we can use in the United States provided we desire to make diplomatic political advances, and pay still greater freight rates. Even now the cost to the Eastern States of transporting timber supplies from the western coast probably exceeds fifty million dollars a year. This amount, if expended annually upon the acquisition and forest management of land in the eastern mountains, would not only provide a timber supply in perpetuity, but also it would protect the headwaters of navigable rivers on both sides of the Appalachian chain—the Ohio, Cumberland, Tennessee, and the network of streams that flow from these mountains into the Atlantic from Florida northward to Maine.

Realizing the economic importance of this situation, Congress has appropriated $19,335,860 to June 30, 1929, with which the Federal Government had acquired on that date 3,605,185 acres at an average price of $4.91 an acre. This sum was authorized by the Weeks law signed by President Taft in 1911, and subsequent legislation.

The work of acquiring land and placing it under National Forest administration has been done with intelligence and vigor by the United States Forest Service, under direction of the National Forest Reservation Commission as provided by the Weeks law. The Commission is made up of three members of the Cabinet—the Secretaries of War, Interior and Agriculture with two senators appointed by the President of the Senate, and two representatives appointed by the Speaker of the House. The present membership of this Commission is as follows: Patrick Hurley, Secretary of War; Ray Lyman Wilbur, Secretary of the Interior; Arthur N. Hyde, Secretary of Agriculture; Senators Henry W. Keyes, of New Hampshire, and William J. Harris, of Georgia; and Representatives Willis C. Hawley, of Oregon, and James B. Aswell, of Louisiana. This Commission has given statesmanlike consideration to the task in hand.

Purchases have been made in fourteen states and cover an area of 3,568,749 acres, distributed as follows: Virginia, 602,067 acres; New Hampshire, 482,848 acres; North Carolina, 382,706 acres; Tennessee, 381,535 acres; Pennsylvania, 344,607 acres; West Virginia, 312,391 acres; Georgia, 265,728 acres; Arkansas, 258,816 acres; Michigan, 184,253 acres; Alabama, 103,791 acres; Florida, 93,826 acres; Minnesota, 77,815 acres; South Carolina, 44,884 acres; and Maine, 33,482 acres.

These areas acquired during a period of nineteen years constitute only about 20 per cent of the areas needed, in the opinion of the Geological Survey, to regulate the flow of navigable streams rising in the Appalachian Mountains. At this rate, the original program adopted in 1911 will be consummated in the year 2010, a record not creditable to the people of the United States. In 1900, when the first plans originated, the total area now contemplated could have been had, it is asserted, for less money than already has been expended on one-fifth of the property. The National Forest Reservation Commission repeatedly has recommended that not less than $3,000,000 should be expended annually for the acquisition of these forest areas, and now announces a policy of $5,000,000 a year as essential to the forest welfare of the country, in order to carry out the original plans. The American Forestry Association has sponsored bills of $5,000,000 a year repeatedly. The Senate on three occasions has passed bills authorizing expenditures of this sum. But each time the Administration and the Bureau of the Budget have cut down the figures.

In addition to wood, water and soil protection, our Eastern National Forests are more and more providing another national essential—outdoor recreation. Already millions of people are annually visiting these forests in the eastern mountains. It is estimated that 2,600,000 persons entered the White Mountain National Forest in New Hampshire in the summer of 1929. Here roads and trails are protected, beauty spots are left uncut, wilderness (*Continuing on page* 483)

IN OUR EASTERN FORESTS

(1) Laurel time in the Land of the Sky—showing Big Bald, in the Pisgah National Forest, North Carolina. (2) A typical mountain home in the Southern Appalachians. (3) The beauty of falling water—Conestee Falls, in North Carolina. (4) Logging in the White Mountains in the days prior to federal ownership. (5) Primeval timber types in New Hampshire. (6) Looking through the birches in the White Mountain National Forest toward the Presidential Range

CANOEING ON THE SUPERIOR

By WILLIAM L. BARKER, JR.

Photograph by B. L. Brown

Man's Rendezvous With the Wilderness

"JUST keep pushing the water back," is the advice generally given to the bow paddler in a canoe by his mate in the stern. Jim, the forest ranger, and I had been doing it all day. We were measuring portages and making plans for the protection of the wilderness canoe country of the Superior National Forest, in Minnesota.

Miles of the Kawishiwi River, Lakes One, Two, Three and Four had been "pushed back" and we were entering the real wilderness, the virgin forest at Hudson Lake. As we slid through the short channel between Four and Hudson, we passed within a canoe length of a cow moose standing with her calf near the shore. She threw up her head and trotted away with a rather awkward yet majestic bearing.

Long before we came within sight of the portage to Lake Insula, we scented smoke and knew that we would have neighbors that night, for the sun was setting and we would have to make camp at the next "carry." We had planned on a fish supper, for there was a good pike hole at the foot of the rapids in Hudson. As we neared the shore, I put my short casting rod together, fastened on a plug and on the second cast pulled out a fine five-pound wall-eyed pike.

The campers on the lower end of the portage noticed the "United States Forest Service" marks on our equipment and left their preparations for supper to ask about the route down the river. We talked for a few minutes and unnoticed by them inspected their camp and equipment.

They were well outfitted; not overloaded, yet they had the essentials—seventeen-foot canoe with good width, comfortable yoke, repair kit tied under the front seat, hardwood paddles, light cruiser's ax and belt ax with sheaths, silkoline tent with canvas floor and bobinette (mosquito-proof) front, air matresses, nested aluminum cooking outfit, real wool blankets, food in cloth bags, and very little canned stuff.

Their camp-fire was of reasonable size and they had pulled the ground litter back from it fairly well. We showed them the trick of wetting the moss and ground in a circle around the fire to keep it from creeping out.

Then Jim and I packed across the portage to the Lake Insula side. We preferred to load the canoe and start out on the water after breakfast rather than have to pack right after eating. Our tent poles of a year ago were leaning against a tree and were still serviceable. It is an unwritten rule of the canoe route that tent poles

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As we slid quietly along, we passed within a canoe length of a cow moose standing with her calf near the shore

Photograph by B. L. Brown

Then Jim and I packed across the portage to the Lake Insula side

be set up in this way instead of being thrown on the ground to rot, become lost, or be broken. Just a woodsman's trick of conservation that saves time and timber.

We pitched our tent, straightened up the "dry-laid," rock fireplace and cooking rack and built a fire. While I unpacked the cooking outfit Jim steaked the fish.

Very soon the coffee was steaming. The fish steaks, cut thin for quick frying, were popping in the deep, boiling grease and the biscuits were rising and browning in the reflector oven. As we sat down to eat, our portage neighbors dropped in.

"Fellows, we're all wrapped up in this country," said one. "It's a godsend for the business men and desk workers. Many city people need a place like this, within

a night's ride of their offices, where they can get away from everything for a few weeks each year."

"We're sold on this kind of a vacation for reconditioning," said another. "We want to come back every year, but we've read and been told that this country was to be opened up, and that the wilderness would be ruined."

"My," said Jim, "that sounds real serious. We aren't through eating yet. Have some blueberry shortcake with us." He handed each of the men a plate. "Get some biscuits out of the oven over there, break 'em open, butter 'em, pour a lot of these blueberries over them,

Photograph by Clara Jacobson

A full moon was rising on the lake—the beauty of midnight blue etched in silver

some sugar, then here's some fresh cream. Bill picked the blueberries while I replaced some fire signs a few portages back. Paper signs are no good on this route. Bears tear 'em down faster than I can put 'em up."

While they finished their shortcake, Jim and I washed the dishes, freshened-up the fire with some pine knots and loaded our pipes. I rubbed on a little more of Jim's favorite mosquito formula and passed the bottle.

A full moon was rising on Insula. That is a picture that a forester should not try to describe. If Hudson is a gem, Insula is the crown jewel of the country.

"Now about this ruining the region with roads and taking the wild out of the wilderness," said Jim. "Right here you are in the heart of the finest wilderness canoe country in the Superior National Forest, probably the most wonderful canoe country in the world. And it will be kept just that if it is in the power of the Forest Service to do it.

"The Service has seen the desirability of maintaining primitive canoe camping areas, has formed policies to protect the welfare of the canoe campers and planned to take care of the other recreational interests according to the adaptability of the different parts of the forest for the several types of recreation.

"About 1,000 square miles of the forest has been set aside as a wilderness area. Some of that has been designated as canoe country and special rules have been laid down for its development—really prevention of de-

velopment. No roads, no resorts, no summer residences. We would have liked to have said no motorboats except for fire and game patrol, but we were afraid we did not have control of the water and could not get away with it.

"Other special rules have been made for development in the motorboat areas. There, hotels or lodges are planned to provide accommodations for the launch passengers, just as hotels are necessary for the convenience of automobile tourists. The lakes are too large for safe canoe travel. The Forest Service has to have launches on them to be sure of getting across with fire crews.

"Automobile recreational development, which will include roads, is planned in the area not suited for canoe or launch travel. It would be as foolish to set these areas aside for canoe camping as it would be to plan horse trails across the lakes. You cannot paddle on dry land. The bars are more or less down in the automobile area. Hotels, summer residences and filling stations will be needed and permitted, but their distribution will be regulated and the types of buildings made harmonious with the surroundings.

"The plan correlates the economic and the esthetic—timber production, recreation and water power. The forest is zoned and each area is allocated to that use for which it is best adapted and needed. Along the canoe routes and around lakes and other recreational centers the timber will be maintained in as nearly its natural condition as is consistent with adequate fire protection. In the back country, away from the areas required for recreation, timber production and utilization will be practiced under the most intensive forest management.

"There is no need for conflict between the social and economic developments, if each is planned wisely.

"There is a lot more I could say. Forest-land management and the correlation of uses is a big problem, but it is bed time."

"All right, rangers. We'll tell our misinformed friends in Chicago that the Superior is in safe hands. See you next year."

We blew up our air beds and crawled in, disturbed very little by the hooting of the owl in the pine trees, the yelping of the brush wolf on the hill, or the occasional sharp crack of a startled beaver's tail on the surface of Lake Insula.

The Arrowhead Association

Superior! A godsend to men—the most wonderful canoe country in the world

Knowing Your National Forests

ALABAMA

ALABAMA NATIONAL FOREST—headquarters, Athens, Tennessee—area, 114,490 acres.

ALASKA

CHUGACH NATIONAL FOREST—Near Mt. Wrangle—headquarters, Cordova—area, 4,799,683 acres.

TONGASS NATIONAL FOREST—Sitka and Old Kassan National Monuments—headquarters, Ketchikan—area, 16,546,242 acres.

ARIZONA

APACHE NATIONAL FOREST—partly in New Mexico—headquarters, Springerville—area, 1,564,918 acres.

COCONINO NATIONAL FOREST—Montezuma Castle—headquarters, Flagstaff—area, 1,725,316 acres.

Punch Bowl Falls—In the Oregon National Forest

CORONADO NATIONAL FOREST—near Papago Indian Reservation—headquarters, Tucson—area, 1,481,698 acres.

CROOK NATIONAL FOREST—near San Carlos Indian Reservation—headquarters, Safford—area, 1,424,389 acres.

KAIBAB NATIONAL FOREST—national deer preserve—adjoining Grand Canyon—headquarters, Kaibab, Utah—area, 723,411 acres.

PRESCOTT NATIONAL FOREST—Headquarters, Prescott—area, 1,208,029 acres.

SITGREAVES NATIONAL FOREST—near Petrified Forest National Monument—headquarters, Holbrook—area, 794,424.

TONTO NATIONAL FOREST—Tonto National Monument—headquarters, Phœnix—area, 2,262,044 acres.

TUSAYAN NATIONAL FOREST—adjoining Grand Canyon National Park—headquarters, Williams—area, 1,294,511 acres.

ARKANSAS

OUACHITA NATIONAL FOREST—near Hot Springs National Park—headquarters, Hot Springs—area, 699,957 acres.

OZARK NATIONAL FOREST—headquarters, Russellville—area, 349,731 acres.

CALIFORNIA

ANGELES NATIONAL FOREST—great watershed and forest recreation area—headquarters, Los Angeles—area, 644,138 acres.

CALIFORNIA NATIONAL FOREST—near Round Hill Indian Reservation—headquarters, Willows—area, 826,573 acres.

CLEVELAND NATIONAL FOREST—near Salton Sea—headquarters, San Diego—area, 380,589 acres.

ELDORADO NATIONAL FOREST—headquarters, Placerville—area, 560,257 acres.

INYO NATIONAL FOREST—partly in Nevada—near Death Valley—headquarters, Bishop—area, 1,581,769 acres.

KLAMATH NATIONAL FOREST—partly in Oregon—headquarters, Yreka—area, 1,533,596 acres.

LASSEN NATIONAL FOREST—Mt. Lassen National Park—headquarters, Susanville—area, 921,653 acres.

MODOC NATIONAL FOREST—partly in Oregon—famous lava beds—headquarters, Alturas—area, 1,494,407 acres.

PLUMAS NATIONAL FOREST—headquarters, Quincy—area, 1,112,852 acres.

SAN BERNARDINO NATIONAL FOREST—headquarters, San Bernardino—area, 597,326 acres.

SANTA BARBARA NATIONAL FOREST—important watershed forest—headquarters, Santa Barbara—area, 1,775,678 acres.

SEQUOIA NATIONAL FOREST—adjoining Sequoia National Park—headquarters, Porterville—area, 1,329,616 acres.

SHASTA NATIONAL FOREST—Picturesque Mt. Shasta—headquarters, Mt. Shasta—area, 891,407 acres.

SIERRA NATIONAL FOREST—adjoining Yosemite National Park—headquarters, Northfork—area, 1,494,682 acres.

STANISLAUS NATIONAL FOREST—adjoining Yosemite National Park—headquarters, Sonora—area, 823,649 acres.

TAHOE NATIONAL FOREST—partly in Oregon—famous Lake Tahoe—headquarters, Nevada City—area, 559,008 acres.

TRINITY NATIONAL FOREST—headquarters, Weaverville—area, 1,410,629 acres.

COLORADO

ARAPAHO NATIONAL FOREST—adjoining Rocky Mountain Park—headquarters, Hot Sulphur Springs—area, 639,906 acres.

COCHETOPA NATIONAL FOREST—headquarters, Salida—area, 908,787 acres.

COLORADO NATIONAL FOREST—adjoining Rocky Mountain National Park—headquarters, Fort Collins—area, 826,776 acres.

GRAND MESA NATIONAL FOREST—headquarters, Grand Junction—area, 659,584 acres.

GUNNISON NATIONAL FOREST—headquarters, Gunnison—area, 911,629 acres.

HOLY CROSS NATIONAL FOREST—famous Mount of the Holy Cross—headquarters, Glenwood Springs—area, 1,124,318 acres.

LEADVILLE NATIONAL FOREST—headquarters, Leadville—area, 928,884 acres.

MONTEZUMA NATIONAL FOREST—near Mesa Verde National Park—headquarters, Mancos—area, 727,599 acres.

PIKE NATIONAL FOREST—famous Pikes Peak—headquarters, Colorado Springs—area, 1,089,603 acres.

RIO GRANDE NATIONAL FOREST—Wheeler National Monument—headquarters, Monte Vista—area, 1,137,645 acres.

ROUTT NATIONAL FOREST — headquarters, Steamboat Springs—area, 750,650 acres.

SAN ISABEL NATIONAL FOREST—headquarters, Pueblo—area, 615,779 acres.

SAN JUAN NATIONAL FOREST—near Mesa Verde National Park—headquarters, Durango—area, 1,244,593 acres.

UNCOMPAHGRE NATIONAL FOREST—near Colorado National Monument—headquarters, Delta—area, 756,530 acres.

WHITE RIVER NATIONAL FOREST—Colorado River—headquarters, Glenwood Springs—area, 892,000 acres.

FLORIDA

CHOCTAWHATCHEE NATIONAL FOREST—headquarters, Pensacola—area, 184,449 acres.

OCALA NATIONAL FOREST—headquarters, Pensacola—area, 158, 731 acres.

IDAHO

BOISE NATIONAL FOREST—headquarters, Boise—area, 1,-063,314 acres.

CARIBOU NATIONAL FOREST—near Fort Hill Indian Reservation—headquarters, Montpelier—area, 712,896 acres.

CHALLIS NATIONAL FOREST—headquarters, Challis—area, 1,345,128 acres.

CLEARWATER NATIONAL FOREST—headquarters, Orofino—area, 799,459 acres.

COEUR D'ALENE NATIONAL FOREST—headquarters, Coeur d'Alene—area, 674,248 acres.

IDAHO NATIONAL FOREST—headquarters, McCall—area, 1,733,724 acres.

LEMHI NATIONAL FOREST—partly in Montana—near Lemhi Indian Reservation—headquarters, Mackay—area, 1,358,839 acres.

MINIDOKA NATIONAL FOREST—partly in Utah—headquarters, Burley—area, 591,195 acres.

NEZPERCE NATIONAL FOREST—headquarters, Grangeville—area, 1,661,107 acres.

PAYETTE NATIONAL FOREST—headquarters, Emmett—area, 1,308,391 acres.

PEND OREILLE NATIONAL FOREST—adjoining Canadian boundary—headquarters, Sandpoint—area, 676,619 acres.

SALMON NATIONAL FOREST—near Lemhi Indian Reservation—headquarters, Salmon—area, 1,707,834 acres.

SAWTOOTH NATIONAL FOREST—rugged Sawtooth Mountain range—headquarters, Hailey—area, 1,166,729 acres.

SELWAY NATIONAL FOREST—headquarters, Kooskia—area, 1,689,960 acres.

ST. JOE NATIONAL FOREST—headquarters, St. Maries—area, 603,211 acres.

TARGHEE NATIONAL FOREST—partly in Wyoming—Yellowstone Park—headquarters, St. Anthony—area, 1,376,900 acres.

WEISER NATIONAL FOREST—headquarters, Weiser—area, 566,385 acres.

MICHIGAN

HURON NATIONAL FOREST—headquarters, East Tawas—area, 237,135 acres.

MINNESOTA

BELLEVUE-SAVANNA NATIONAL FOREST—headquarters, Winona—area, 10,710 acres.

MINNESOTA NATIONAL FOREST—headquarters, Cass Lake—area, 192,350 acres.

SUPERIOR NATIONAL FOREST—Adjoining Canadian boundary and Lake Superior—headquarters, Ely—area, 845,406 acres.

MONTANA

ABSAROKA NATIONAL FOREST—adjoining Yellowstone National Park—headquarters, Livingston—area, 853,607 acres.

BEARTOOTH NATIONAL FOREST—adjoining Yellowstone National Park—headquarters, Billings—area, 660,384 acres.

BEAVERHEAD NATIONAL FOREST—Big Hole Battlefield National Monument—headquarters, Dillon—area, 1,340,860 acres.

BITTERROOT NATIONAL FOREST—headquarters, Hamilton—area, 1,051,104 acres.

BLACKFEET NATIONAL FOREST—adjoining Glacier National Park—headquarters, Kalispell—area, 832,776 acres.

CABINET NATIONAL FOREST—headquarters, Thompson Falls—area, 834,848 acres.

CUSTER NATIONAL FOREST—near Crow Indian Reservation—headquarters, Miles City—area, 591,079 acres.

DEERLODGE NATIONAL FOREST—near Lewis and Clark National Monument—headquarters, Butte—area, 823,199 acres.

FLATHEAD NATIONAL FOREST—adjoining Glacier National Park—headquarters, Kalispell—area, 1,718,820 acres.

GALLATIN NATIONAL FOREST—adjoining Yellowstone National Park—headquarters, Bozeman—area, 561,583 acres.

HELENA NATIONAL FOREST—headquarters, Helena—area, 934,946 acres.

JEFFERSON NATIONAL FOREST—headquarters, Great Falls—area, 1,040,874 acres.

KOOTENAI NATIONAL FOREST—adjoining Canadian boundary—headquarters, Libby—area, 1,361,487 acres.

LEWIS AND CLARK NATIONAL FOREST—adjoining Glacier National Park—headquarters, Choteau—area, 810,731 acres.

LOLO NATIONAL FOREST—near National Bison Range—headquarters, Missoula—area, 894,181 acres.

MADISON NATIONAL FOREST—adjoining Yellowstone National Park—headquarters, Sheridan—area, 956,462 acres.

MISSOULA NATIONAL FOREST—headquarters, Missoula—area, 977,403 acres.

NEBRASKA

NEBRASKA NATIONAL FOREST—headquarters, Halsey—area, 206,026 acres.

NEVADA

HUMBOLDT NATIONAL FOREST—adjoining Duck Valley Indian Reservation—headquarters, Elko—area, 1,322,215 acres.

MONO NATIONAL FOREST—partly in California—adjoining Yosemite Park—headquarters, Minden—area, 1,261,802 acres.

NEVADA NATIONAL FOREST—headquarters, Ely—area, 1,175,128 acres.

TOIYABE NATIONAL FOREST—headquarters, Austin—area, 1,882,840 acres.

NEW HAMPSHIRE

WHITE MOUNTAIN NATIONAL FOREST—partly in Maine—headquarters, Laconia—area, 493,835 acres.

NEW MEXICO

CARSON NATIONAL FOREST—near Aztec Ruins National Monument—headquarters, Taos—area, 1,094,371 acres.

DATIL NATIONAL FOREST—Rio Grande River—headquarters, Magdalena—area, 1,750,103 acres.

GILA NATIONAL FOREST—Cliff Dwellings National Monument—headquarters, Silver City—area, 1,596,416 acres.

LINCOLN NATIONAL FOREST—near Carlsbad Cave National Monument—headquarters, Alamogordo—area, 1,114,095 acres.

MANZANO NATIONAL FOREST—near El Morro National Monument—headquarters, Albuquerque—area, 679,448 acres.

SANTA FE NATIONAL FOREST—Bandelier National Monument—headquarters, Santa Fe—area, 1,245,284 acres.

NORTH CAROLINA

NANTAHALA NATIONAL FOREST—partly in Georgia and South Carolina—headquarters, Franklin,—area, 256,093 acres.

PISGAH NATIONAL FOREST—partly in Tennessee—game preserve—headquarters, Asheville—area 289,796 acres.

OKLAHOMA

WICHITA NATIONAL FOREST—headquarters, Cache—area, 61,480 acres.

OREGON

CASCADE NATIONAL FOREST—headquarters, Eugene—area 1,027,440 acres.

CRATER LAKE NATIONAL FOREST—adjoining Crater Lake National Park—headquarters, Medford—area, 863,725 acres.

DESCHUTES NATIONAL FOREST—adjoining Crater Lake National Park—headquarters Bend—area, 1,303,113 acres.

FREMONT NATIONAL FOREST—adjoining Klamath Indian Reservation—headquarters, Lakeview—area, 849,286 acres.

MALHEUR NATIONAL FOREST—headquarters, John Day—area, 1,051,191 acres.

MT. HOOD NATIONAL FOREST—picturesque Mt. Hood—headquarters, Portland—area, 1,063,936 acres.

OCHOCO NATIONAL FOREST—headquarters, Princeville—area, 721,973 acres.

SANTIAM NATIONAL FOREST—headquarters, Albany—area, 614,914 acres.

SISKIYOU NATIONAL FOREST—near Oregon Caves—headquarters, Grants Pass—area, 1,362,636 acres.

SIUSLAW NATIONAL FOREST—adjoining Pacific Ocean—headquarters, Eugene—area, 531,314 acres.

UMATILLA NATIONAL FOREST—partly in Washington—headquarters, Pendleton—area, 1,252,823 acres.

UMPQUA NATIONAL FOREST—adjoining Crater Lake National Park—headquarters, Roseburg—area, 1,015,731 acres.

WALLOWA NATIONAL FOREST—headquarters, Wallowa—area, 969,618 acres.

WHITMAN NATIONAL FOREST—headquarters, Baker—area, 1,352,476 acres.

PENNSYLVANIA

ALLEGHENY NATIONAL FOREST—adjoining Allegheny Indian Reservation—headquarters, Warren—area, 291,337 acres.

PORTO RICO

LUQUILLO NATIONAL FOREST—headquarters, Rio Piedras—area, 12,443 acres.

SOUTH DAKOTA

BLACK HILLS NATIONAL FOREST—partly in Wyoming—near Devil's Tower—headquarters, Deadwood—area, 628,383 acres.

HARNEY NATIONAL FOREST—adjoining Wind Cave National Park—headquarters, Custer—area, 512,540 acres.

TENNESSEE

CHEROKEE NATIONAL FOREST—partly in Georgia—headquarters, Knoxville—area, 354,117 acres.

UNAKA NATIONAL FOREST—partly in North Carolina and Virginia—headquarters, Bristol—area, 189,016 acres.

UTAH

ASHLEY NATIONAL FOREST—near Dinosaur National Monument—headquarters, Vernal—area, 986,789 acres.

CACHE NATIONAL FOREST—partly in Idaho—adjoining Fort Hill Indian Reservation—headquarters, Logan—area, 776,826 acres.

DIXIE NATIONAL FOREST—partly in Nevada—near Zion National Park—headquarters, Cedar City—area, 853,294 acres.

FISHLAKE NATIONAL FOREST—headquarters, Richfield—area, 1,387,079 acres.

LA SAL NATIONAL FOREST—partly in Colorado—near Natural Bridges—headquarters, Moab—area, 530,922 acres.

MANTI NATIONAL FOREST—headquarters, Ephraim—area, 725,229 acres.

POWELL NATIONAL FOREST—near Bryce Canyon National Park—headquarters, Panguitch—area, 1,039,996 acres.

UINTA NATIONAL FOREST—headquarters, Provo—area, 1,078,217 acres.

WASATCH NATIONAL FOREST—near Great Salt Lake—Timpanogos Cave—headquarters, Salt Lake City—area, 610,754 acres.

VIRGINIA

NATURAL BRIDGE NATIONAL FOREST—near famous Natural Bridge—headquarters, Lynchburg—area, 161,910 acres.

SHENANDOAH NATIONAL FOREST—partly in West Virginia—headquarters, Harrisonburg—area, 429,876 acres.

WASHINGTON

CHELAN NATIONAL FOREST—adjoining Canadian boundary—Lake Chelan—headquarters, Okanonogan—area, 1,796,324 acres.

COLUMBIA NATIONAL FOREST—adjoining Yakima Indian Reservation—headquarters, Vancouver—area, 757,492 acres.

COLVILLE NATIONAL FOREST—adjoining Canadian boundary—headquarters, Republic—area, 747,875 acres.

KANIKSU NATIONAL FOREST—partly in Idaho—adjoining Canadian boundary—headquarters, Newport—area, 465,933 acres.

MT. BAKER NATIONAL FOREST—beautiful Mt. Baker—headquarters, Bellingham—area, 1,460,334 acres.

OLYMPIC NATIONAL FOREST—Quinault Indian Reservation—Mount Olympus—headquarters, Olympia—area, 1,494,856 acres.

RAINIER NATIONAL FOREST—adjoining Mt. Rainier National Park—headquarters, Tacoma—area, 1,261,509 acres.

SNOQUALMIE NATIONAL FOREST—near Puget Sound—headquarters, Seattle—area, 619,451 acres.

WENATCHEE NATIONAL FOREST—headquarters, Wenatchee—area, 874,029 acres.

WEST VIRGINIA

MONONGAHELA NATIONAL FOREST—headquarters, Elkins—area, 193,265 acres.

WYOMING

BIGHORN NATIONAL FOREST—headquarters, Sheridan—area, 1,125,672 acres.

HAYDEN NATIONAL FOREST—partly in Colorado—headquarters, Encampment—area, 396,523 acres.

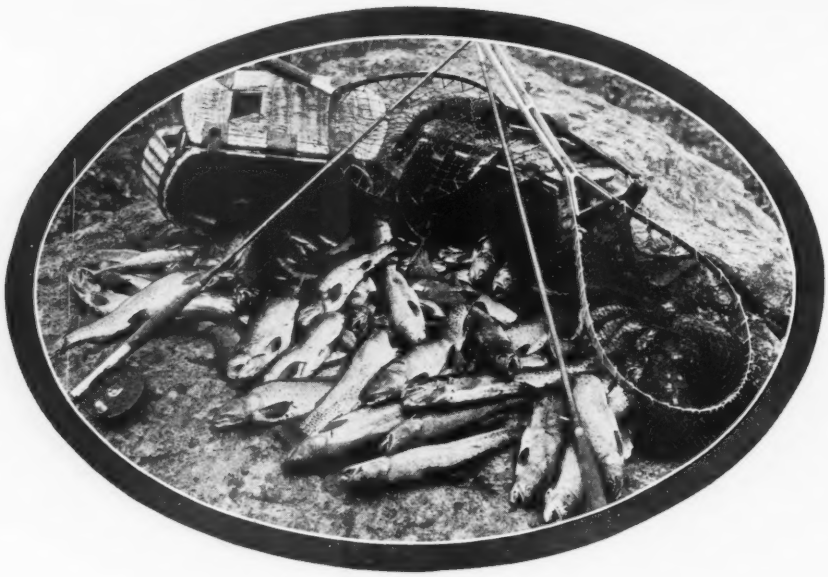
MEDICINE BOW NATIONAL FOREST—headquarters, Laramie—area, 556,032 acres.

SHOSHONE NATIONAL FOREST—adjoining Yellowstone National Park—headquarters, Cody—area, 1,599,967 acres.

TETON NATIONAL FOREST—adjoining Yellowstone and Teton National Parks—headquarters, Jackson—area, 1,787,615 acres.

WASHAKIE NATIONAL FOREST—adjoining Teton National Park—headquarters, Leander—area, 861,185 acres.

WYOMING NATIONAL FOREST—adjoining Shoshone Indian Reservation headquarters, Kemmerer—area, 1,696,768 acres.



Trout Trails

By Paul G. Redington

IF, AS it has been so often said, the National Forests, together with the Public Domain, constitute the last free hunting grounds of outdoor-loving Americans, it is equally true that within the boundaries of these great forest areas there lies the remains of the angler's vanishing paradise where healthy sport may be had for the happy effort of taking it. While civilization is depleting the more accessible streams and while industry is polluting others, the National Forests alone remain, with the National Parks, as the last free fishing grounds of the people of the nation. It is true that some streams within the National Forests are controlled by resort owners and clubs, where the hoi polloi have to right about face when the "No Trespassing" sign is sighted. But these are the exception to the rule. One may still wade up and down publicly owned streams, casting his fly hither and yon, subject only to state license restrictions, forest-fire protection regulations, and to the maintenance of a clean camp.

Twenty-five years ago, when the Forest Reserves were transferred from the Department of the Interior to the Department of Agriculture, foresters could not foresee the great National Forest road and trail development of the succeeding decades. The automobile at that time was a novelty. The forest areas were comparatively inaccessible except to the hardiest, and the streams on most of the National Forests were teeming with rainbow, black-spotted, eastern brook and Loch Leven trout. In the far reaches of the old Sequoia Reserve the beautiful golden trout was to be found. These forests, however, had to be opened up by road and trail for administrative purposes and to permit quicker access for fire crews. The public demand for roads was an insistent one. And so, within a quarter of a century there has been an amazing transition from the conditions of the early days when trout species were abundant and fishermen comparatively few, to the present day when anglers are so numerous and their catch so heavy that

Photograph by Dr. J. E. Broaddus

Fish planting in one of the high mountain streams of the National Forests

they have depleted many streams of the sockdolagers. Now literally millions of fingerlings and hundreds of thousands of pond-reared trout from four to six inches in length are transported each year from state and federal hatcheries and placed in the streams of the National Forests.

It is estimated that 31,000,000 people visited the National Forests in 1929. Of course, probably not more than one in every hundred dipped a line in a stream, but it is safe to say that many thousands—true disciples of Izaak Walton—from time to time took their quota of trout from the streams.

The change has brought some real problems to the forest administrator and the fish culturist. Where thousands of people annually occupy and use an area that twenty-five years ago was available to hundreds only, it is plain that the forest caretaker's job is one of great responsibility. These people must have space in which to camp comfortably. Sanitary improvements must be installed. Fireplaces must be built to obviate the old custom of building fires without regard to inflammable material. The writer is familiar with a stream in one of the National Forests to which thousands of fishermen go on account of its proximity to large population centers. I have seen anglers strung out for several miles, each one of them not fifty yards from his neighbor. Many of them have no conception of the hazard their presence creates. And does it not follow that there lies a great incipient fire menace in the presence of such numbers whose minds are intent on getting their limit and forgetful of where they throw their match or cigarette? So the forest guard must be on the ground to see to it that these ardent devotees of a great sport conduct themselves in a becoming manner where fire and sanitation are concerned.

Photograph by Kiser

**"A rod, a gun and a bamboo pole,
A mountain stream or a fishing hole,
The whole outdoors so quiet and still
Where the feet of man may wander at will."**

Scores of hatcheries in the states where National Forests are located are hard pressed indeed to produce annually the number of young fry necessary to meet the increasing demands of the angling fraternity. These hatcheries have to cater to the requests of counties and sportsmen's associations and while well equipped to produce large numbers of juvenile

trout they are often handicapped in the satisfactory placement of the fish in their abiding place.

The forest men are the agents looked to by the hatchery people to aid in the transportation by auto or pack train of the young trout and their proper placement in the destined water. This process of transportation incidentally calls for some sound knowledge of fish requirements. Aeration of the cans at intervals and maintenance of a stipulated, even degree of temperature are vital considerations. If the trip is a long one, defective and dead fish must be removed from the containers. When the final dumping process is reached, great care must be taken to adjust gradually the temperature of the water in the can to that of the stream.

So the forest officer in addition to his regular qualifications has had to acquire the special knowledge necessary to successful fish-planting practices. Without their aid in this field, many of our National Forest streams would now not be particularly attractive to the fisherman.

When it was proposed to lay aside from the Public Domain its heavily wooded mountains as National Forests, little thought was given to the fish conservation aspect. The watershed protection function of these forests, the control of fire, the curtailment of excessive grazing, and the disposal of the mature timber were the dominating needs for such action in the minds of Roosevelt, Pinchot and others. The vision and power which they possessed made secure from pillage for all time a vast forest area, and where villification against and excoriation of the public officials once was rampant, we find now an enthusiastic appreciation by states and local communities of the great National Forests within their borders.

Would that legion of fishermen now be found along these streams had there not been Roosevelt, Pinchot and others who thirty years ago made secure in the public fold the future of a great portion of the western forest terrain by the creation of National Forests? I think not. The unregulated use of the timber and grazing lands would certainly not have been curbed; the fire fiend would have continued on his way largely uncontrolled. Denudation of vast forest reaches would surely have occurred, bringing in its wake pollution or an uncertainty of steady stream flow that would have been a death knell indeed to the wonderful game-fish life indigenous to these water courses.

Though the American angler is long on talk and short of memory, his tribe will some day bless those men who in saving to the whole country a great and valuable forest property incidentally made possible for the angler the sport which is now his along the streams of the National Forests.

Not one of the trout family fails to give the angler a run for his money. We should all be happy in the realization that it is still possible to travel the banks of hundreds of streams within the National Forests, discarding all thoughts of the everyday responsibilities and cares of life, and be able to creel the rainbows, steelheads, Dolly Vardens, Lock Levens, German browns, and the brook trout. Then there is the gorgeously colored and wonderfully game golden trout of the Sierras of California, named *Salmo roosevelti* in honor of our sportsman-president.

As one looks back on his experiences over nearly a quarter of a century in forest work, he recalls vividly those instances where he was forced to make a momentous decision. Sometimes it concerned the settlement of a controversy between a sheepman and a cattleman, often it dealt with a change in silvicultural marking practice, or dealt with the proper handling of an unexpected forest-fire outbreak. When these official decisions had been made, the best relief which many of us could find was to repair for a few hours once or twice a month to the nearest stream.

There were times also when momentous decisions were necessary in the angling game. One instance is recalled where it took considerable pondering to determine just what kind of lure should be used to take from the Vallecitos River, in southwestern Colorado, a five-pound rainbow trout, a grandfather which had eluded for a long time the efforts of the local forest ranger to bring him to land. In another instance, where a seven-pound steelhead had been well hooked, tired out, and had been lined up on the shallow beach, only to free himself from the hook, it called for a quick decision on the part of the forest supervisor to throw himself into the water and act in the capacity of a human landing net to retrieve this old timer. In one more case it took some time to figure out how one might descend to the depths of the canyon to take one of the beauties which the angler could see in the stream fifty feet below him, and the decision when made involved the lowering of the angler on a rope and finally pulling him and the catch of fish back in the same manner.

In conclusion, it might be said that the art of angling fits happily into the life of a forest officer, and most of them are thoroughly devoted to the sport. Therefore, they are interested in seeing that the streams are kept unpolluted and restocked. And because of the guarantee of permanency given by Forest Service administration, the art of Izaak Walton will endure on the National Forests for generations to come.

Beating Fire

How Efficiency, Manpower and Equipment Defeat the Greatest Enemy of the National Forests

By Roy Headley

The Lookout

IN 1907, after three successful fire seasons, the Forest Service felt justified in saying in the Forester's annual report that "the measures adopted for detecting and extinguishing fires on the National Forests are efficient."

Since that time many things have happened, including seven "bad" years. In 1930, after all the ups and downs which have occurred since the report of 1907 was written, fire executives of the National Forests are still confident but are cautious about claiming mastery of the job.

The twenty-year period ending with 1929 includes many humiliating defeats but the record is nevertheless far from being a total loss. From 1910 to and including 1914 the average annual area burned was a little more than seven-tenths per cent of the gross area of the National Forests, dropping to six-tenths per cent during the period from 1915 to 1919. The next five-year period, up to 1924, was less than three-tenths per cent, while from 1925 to and including 1929 the area burned was a little over three-tenths per cent.

On eighty-two out of 150 National Forests the average annual loss in area burned for the five-year period ending with 1929 has been less than one-tenth of one per cent. Certainly fire control on considerably more than half of the National Forests can be said to be successful. Four out of the nine National Forest regions into which all the National Forests are organized show an average annual loss for the five-year period ending with 1929 which is less than one-tenth of one per cent.

The dark side of the picture is that during the last five-year period the average annual loss has started back up. In 1926 the Kaniksu National Forest, in Washington, was visited by over 200 fires started in a single day by electrical storms. Such a volume of fires all in one day was altogether more than could be handled with the available equipment and personnel. The same organization had successfully handled a total of seventy-six fires from a single storm earlier in this same season. This concentration of lightning fires and losses constitutes one of the most baffling problems confronting foresters in regions where dry or near dry electrical storms occur.

The result of sparks from a logging engine on the Pike National Forest, in Colorado. Government forest officers are ready to go to the limit of their power to prevent fires of this nature

Roads are needed above everything else in forest fire protection. ***Top:*** **The old forest trail of the pack-trains.** ***Right:*** **Modern machinery in forest road construction.** ***Below:*** **The completed road**

So much for past history. The question now is what are the Forest Service and its host of interested and active cooperators doing to insure that the future unfolds a better record on the forests where losses are still not acceptable.

First of all the Bureau of the Budget and Congress have provided increases of $188,500 for additional personnel and equipment; $306,000 for protective improvements such as additional telephone lines and lookout structures; and $1,500,000 for protection roads and trails. The importance of an adequate system of roads and trails is illustrated by the fact that in the disastrous season of 1929 no fire escaped in north Idaho and western Montana which occurred within striking distance of a road. It is too much to expect that no fire will ever escape which occurs within striking distance of a road, but the practical significance of this 1929 experience can hardly be overemphasized. Moreover, the construction of roads and trails in the often trackless wilderness of the National Forests does more than provide for rapid travel and transportation when the race to one or more actual fires starts. Such work scatters thousands of men through the woods during the fire season. These men are selected for their capacity as fire-fighters as well as road and trail builders and as a rule are given the same training which is given to guards employed for fire-control purposes alone.

Clear thinking and the development of heavy machinery which can be employed in road building have led to a sharp distinction between the type of roads required for general public travel and the type of roads required for protection of a forest from fire. Under modern conditions a road for general travel must provide for high speed and dense traffic. There must be cuts and fills, high standards of alignment, and relatively great width of travel surface—all of which costs heavily and so reduces the mileage which can be constructed with a million dollars that there is relatively little resulting benefit to fire control.

The fire-control executive wants mileage of roads above everything else. He is well pleased with a protection road over which he can make even twenty miles an hour if the cost of construction is such as to enable him to buy the most forest protection with a given sum of money.

Many mechanical aids are being summoned to help in the struggle with forest fires. Portable pumps are being made more efficient every year and the technique of using water effectively in suppression is steadily advancing. Tank trucks are slowly being acquired for the transportation of water. Normally each tank truck pays for itself the first season by enabling fires to be caught small which would otherwise escape and become costly and destructive. The drawback is that tank truck units are expensive and it is a slow job to find the money for their purchase.

Speed in action all the way from the discovery of a fire until the last spark is out lies close to the heart of effective fire control. Speed in detection of fires will be facilitated by the construction of additional telephone lines and lookout structures. Speed in the "get away" to a fire is largely a matter of preparedness and good human engineering—in which fire executives are becoming more proficient every year. Speed in travel to fires is largely controlled by the availability of roads and trails. Speed in "corralling" and stopping a fire

when reached depends on the many-sided art of fire-fighting. One of the important factors making for speed in corralling a fire is the rate at which a fire line can be thrown out. Speed in the construction of fire lines is about to receive a great impetus from the use of machinery.

Tractor-drawn plows have been developed for use in those occasional regions where the stand of timber is open enough and the ground is level enough to use such a device. In 1930, after years of demonstration and experimentation, the horse and plow is likely to play a prominent part in speeding up the construction of fire lines. In one National Forest region a considerable proportion of the increase available for fire control in 1930 will be devoted to the purchase of horses and plows, together with the trucks required for their transportation. Such equipment enables ten men to do the work of a hundred or more.

The first experiment of the Forest Service with radio in 1920 was a decided failure. In 1927 a fresh start was made, and proceeding with more care and caution advancement has been made to the point where portable radio sets will be given the acid test of actual use. If no unforeseen complications occur radio will take its place as a supplement to telephone communication and will be particularly valuable in providing for prompt communication with trail crews and other detached units of workers whose services may be needed for speedy action on newly discovered fires.

While the technique of using water effectively in forest-fire suppression is steadily advancing, manual labor with mattock, hoe and ax is still the most vital factor on the fire line

Throughout the ten years during which aircraft has been tried out for various purposes on the National Forests, this mechanical aid to fire control has been a disappointment to fire executives. The development of twelve-passenger planes however, promises an interesting possible application of aircraft to fire control. A block of several million acres of land in the National Forests of Idaho is entirely without roads at the present time. The country is rugged and the cost of an adequate system of protection roads would load the National Forest enterprise in this region with a burden of capital investment too heavy to be carried comfortably. The regional forester will, during the coming season, take the initial steps in clearing landing fields on which fire-fighters from nearby labor centers could be landed speedily with twelve-passenger planes in the event that fires get beyond the control of fire guards already in the woods. There are all sorts of difficulties in the way, of course. It may not be possible to find enough feasible locations for landing fields to make planes serve the need for transportation of men and equipment in emergency periods. It may also be found that air currents in the mountain coves and on ridges where landing fields would physically be possible will be found too tricky for reliable landings by large planes. All that can be said at the present time is that one new departure in the use of aircraft will be experimented with during the coming season.

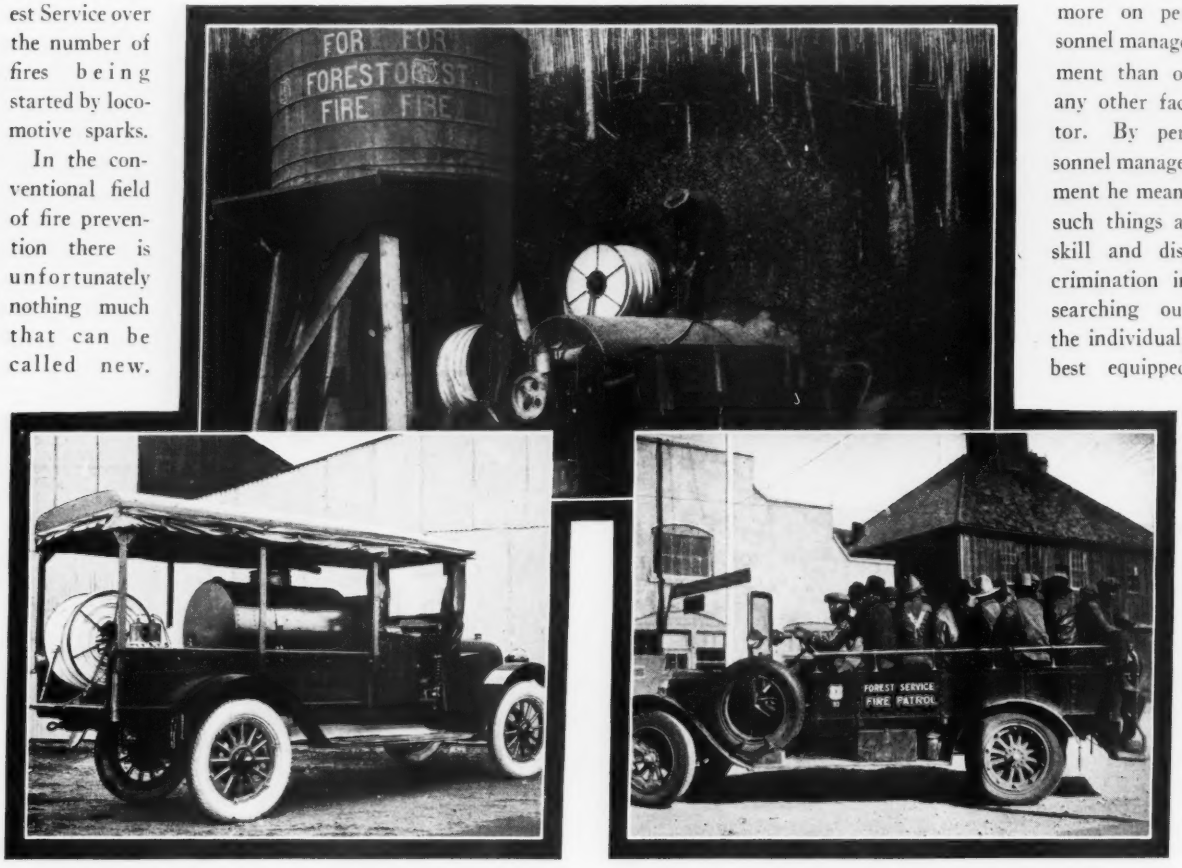
In the field of fire prevention there are important new and promising developments of method and attitude on the part of fire executives. The history of the fire season of 1929 records an unusual number of disastrous conflagrations which can be prevented in future only by a certain difficult type of fire-prevention effort. In one instance a lamentable railroad fire occurred and grew to enormous size. Post-mortem analysis indicates that after the fire began to spread nothing that was humanly practicable could have kept it from reaching the huge size it finally did reach. The only cure is to prevent such a fire from starting again. In a number of other instances, disastrous fires once started on their rapid spread could not have been stopped much short of the area they finally reached. Lack of preparedness, or lack of diligence in the early stages of such fires on the part of fire associations or lumber companies, must be charged with responsibility for what occurred. The remedy, so far as the future is concerned, lies solely in more alertness and more aggressiveness on the part of some responsible executive. Where there is no one else to shoulder the burden of seeing to it that potential disasters are dealt with before instead of after they occur, some National Forest officer must function. The experience of

recent years has brought this lesson home in such a way that fire executives in the Forest Service are entering the season with a determination to resort to heroic measures where necessary to prevent fires from starting or to prevent them from escaping from the small and manageable stage.

In many instances the response from agencies whose methods constitute potential disasters will be prompt and effective, as was the case last summer when a trans-continental railroad changed the grade of coal it was using in response to protests from the Forest Service over the number of fires being started by locomotive sparks.

In the conventional field of fire prevention there is unfortunately nothing much that can be called new. Experiments are being made by the Forest Service and the Bureau of Plant Industry looking to the discovery of a chemical which can be used to sterilize the soil adjacent to heavily traveled roads.

No discussion of the future of fire control on the National Forests should omit mention of one intangible but enormously important factor. One regional forester, who is a veteran of many successes and defeats in fire control, holds to the belief that successful protection from fire depends at the present time more on personnel management than on any other factor. By personnel management he means such things as skill and discrimination in searching out the individuals best equipped



Many mechanical aids are being summoned to help in the struggle with forest fires. *Top:* One of the great tank trucks used in the transportation of water. *Left:* A smaller speed truck, carrying water and equipment. *Right:* Transporting fire-fighters and equipment to the fire line by means of a speed truck

The need for care with fire by the general public is even more urgent than heretofore. All the usual means will be employed on the National Forests. In those occasional communities where incendiarism still has to be contended with, increased efforts will be made to get at the root of the trouble or apprehend the incendiary. Admonitory patrol, camp-fire permits, closing of areas of especial danger to public use, lectures, signs, and every known similar device will be employed wherever possible.

Fire prevention in the form of fire-proofing of places where fires may start is developing very satisfactorily. The State of California is spending many thousands of dollars to fireproof roadsides where fires may start in inflammable dry grass or litter.

No discussion of the future of fire control on the National Forests should omit mention of one intangible but enormously important factor. One regional forester, who is a veteran of many successes and defeats in fire control, holds to the belief that successful protection from fire depends at the present time more on personnel management than on any other factor. By personnel management he means such things as skill and discrimination in searching out the individuals best equipped by experience and native ability to meet the responsibilities of fire-control jobs; training which will insure that every man concerned with fire control will do the right thing at the right time; leadership which will convey confidence and determination to every working group of forest officers; discipline which will convince every man concerned with fire control that anything but the utmost loyalty to the demands of his particular job is unthinkable; and organization which will enable large numbers of men to function with all the effectiveness and smoothness which can be hoped for in so uncertain an enterprise as fire control. Unquestionably the Forest Service and its host of active cooperators will enter the fire season of 1930 stronger than ever before in all these respects.

Photograph by Alaska Aerial Survey, Navy Department

Narrow, deep fjords, dense coniferous forests and high snow-clad mountains combine to produce indescribable beauty in the National Forests of Alaska

National Forests of the Northland

By B. F. HEINTZLEMAN

THE National Forests of Alaska had their real beginning in 1902. Little study or thought had been given at that time to the timberlands of the Territory as almost all of those who came north had eyes but for minerals, fur and fish. Timber to these early pioneers was either merely a hindrance to travel and work, or at least a feature of no consequence.

An exception, however, was Lieutenant George T. Emmons, a naval officer, who acquired an intimate knowledge of conditions on the southern Alaska coast during assignments here when law and order in Alaska were largely represented by the Navy as law-giver, policeman and floating court. Lieutenant Emmons, with a trained, scientific mind, became a student of the things that came under his observation in this pioneer region and is especially noted for his contributions to the ethnology of the Alaska Indians. Apparently he was the first to see the forests as a resource and to recognize their possibilities for the practice of forestry by the federal government to help supply the future timber needs of the Territory and the nation as a whole. The first withdrawal of Public Domain in Alaska for Forest Reserve purposes was made in 1902 upon his recommendation. It involved four islands with an area of 4,500,000 acres in southeastern Alaska and was designated the Alexander Archipelago Forest Reserve.

With this first withdrawal the small group of aggressive, pioneer government foresters, who under President Roosevelt's patronage were then rough-hewing the block which is now the National Forest system of the United States, turned their attention to Alaska. The year 1903 found a forest inspector from the then Bureau of Forestry in Alaska making examinations of timberlands to determine their desirability for addition to this first reserve or as new reserve units. These early government foresters were not long in recognizing that the timberlands of coastal Alaska, with their virgin forests still intact and their ready accessibility to water transportation, offered an excellent opportunity—perhaps the best chance left in the United States—for the application of proper measures of forest management to the timber resources of an entire region and from the start of lumbering—a procedure bound to make the forest resource contribute its utmost to permanent regional development and insure a sustained yearly supply of timber products for the nation.

These investigations were continued in the succeeding years, being especially pressed after the reserves were placed under the supervision of the Forest Service in 1905, and as a result of the findings more withdrawals were made from time to time. By 1909 the withdrawals considered advisable had largely been made and the areas consolidated into

two immense, administrative units, the Chugach National Forest in the region adjacent to Prince William Sound, and the Tongass National Forest, comprising the greater part of southeastern Alaska. In later years some exclusions from, as well as additions to, these units have been made at various times; but by the year mentioned the present form of the forests had largely been attained. As now constituted, the Chugach Forest comprises 4,800,000 acres and the Tongass Forest 16,500,000 acres, the two largest National Forest units in the United States.

The accomplishments of this formative period from 1903 to 1909 can be credited to W. A. Langille, at first a forest inspector in the Bureau of Forestry, and later the forest supervisor of the Alaskan National Forests under the Forest Service. He can truthfully be termed the father of Alaskan forestry. Coming to Alaska in 1903, he started work on examinations of timbered lands for additions to the areas withdrawn the previous year on Lieutenant Emmons' recommendations. Similar work in the succeeding years carried him over most of the Territory. In 1905, when the administration of the withdrawn lands was transferred to the Forest Service, he became the first forest supervisor in Alaska and started on the difficult task of placing these large, isolated and little-known areas under administration, at the same time keeping up his examinations of additional lands for inclusion in the National Forest system. After the many years that have elapsed since he finished his work here, we are in a position to appreciate the wisdom and foresight he displayed in his recommendations for forest-land withdrawals, and when the physical conditions with which he had to contend are considered the amount of work he accomplished was remarkable. His most trying and difficult duties, however, must have come in connection with his efforts to bring the withdrawn areas under proper administration. The local people were very antagonistic to the principle of National Forests, the time was one of great mining ventures in southern Alaska, so that the woods were full of prospectors, miners and promoters. Alaska was a country where the principle of individual rights was highly developed and prior to the withdrawals every man considered this public land and its resources as his for the taking. The country as a whole is an empire in size, the forest areas were extremely large, trained men for handling the delicate and difficult situations that arose with the local people and industries were simply not available, and communication and transportation facilities were poor at best and in many cases simply nonexistent.

Relic of a past age. Totem pole of an Alaska Indian family found in an abandoned native village on National Forest land

Also, it will be remembered that the great Ballinger-Pinchot controversy over the disposition of government-owned coal lands occurred during this period and centered on cases in the Chugach National Forest. It was a bitter contest in which there were no neutrals in Alaska. Every individual and every corporation and agency operating in Alaska was an active partisan on one side or the other, but mostly on the side opposed to the creation of National Forests and the placing of any restrictions on the use of federal-owned natural resources.

Under all of these conditions it can readily be seen that only a man of inflexible determination, high courage, great capacity for work and outstanding physical endurance could achieve success in the undertaking to which the Forest Service had assigned him. Langille proved himself the proper man for the job.

The National Forests of the United States cover a wide range of country and a great variety of conditions, but doubtless no other forest or group of forests presents as unique features as the forests of Alaska. They can be distinctively designated as the "Maritime National Forests" as they are stretched along the southern coast of the Territory for a distance of 1,000 miles and do not extend inland at any point for a greater distance than thirty miles. They comprise a narrow strip of mainland and thousands of adjacent islands of all sizes from a mere rock pinnacle to those having an area of one million acres. The islands and mainland are indented and separated by an amazingly intricate system of interconnected, narrow, navigable fjords. All land surfaces are occupied by mountains, which rise precipitously from the edge of tidewater, the whole region giving the appearance of a partially submerged mountain system, with all of the former valleys now being occupied by straits, canals, bays and inlets, and the tops of the mountains showing as islands and long peninsulas. The lower slopes are covered with dark green, dense forests from the water's edge to elevations of 2,000 feet, while the tops of the ridges and peaks extend to great heights and are capped with perpetual fields of snow and ice. Great glaciers wind down many of the

long valleys of the mainland and discharge ice into the narrow sea channels. The region in which the forests lie is bathed by the warm waters of the Japan current and consequently has an average winter temperature that is only slightly lower than that of Washington, D. C., and with zero weather a rarity. Without doubt it is one of the most scenic regions of North America, presenting an ever-changing, unparalleled picture of mountain grandeur and interesting seashore to the traveler aboard the excursion steamers which thread their way through the quiet waters of the winding, canyonlike fjords.

Most of the National Forests of the United States occupy the highlands along the summits of the country's great mountain chains, where they are isolated from the populated sections and commercial activities of the states in which they lie so that only a small percentage of the people come in close contact with them. The contrary is true of the Alaska forests. They occupy the sections of the Territory which are the most accessible, have the greatest amount of development at present, and lend themselves to the greatest further development in the future. Within these sections, they cover practically all of the land area adjacent to tidewater and this is where all activities are concentrated. Half of the population of Alaska lives within the exterior boundaries of or immediately adjacent to the National Forests which, however, cover but six per cent of the total area of the Territory. As a consequence the forests come in most intimate contact with the lives of the people, and the forest policies established have an immediate, direct and vital effect on their well-being and on the general development of the region. Many of the principal local industrial enterprises are located on forest lands, all of the timber resources are within the forests, practically all of the lands needed for mineral development, homesteads, home sites, town sites and water power are subject to Forest Service administration, and all roads and trails are Forest Service projects. In no state of the Union are National Forests so closely tied in with the daily activities of the entire population and with possible progress in regional development. In view of the foregoing it can be appreciated that the officials of the Forest Service have a great responsibility in the administration of the two Alaska forests, whose combined area exceeds the size of many of the states. It is necessary to establish and hold to a well-thought-out plan for regional development based on the available local resources if this vast section of country is to increase in population and wealth as rapidly as economic conditions will permit and at the same time not be subject to a temporary exploitation of its resources to the detriment of the future.

In the settling of the West agriculture was the foundation of permanent development, and as farm land is a nonwasting resource capable of producing successive crops indefinitely it is especially well fitted to this important function. The southern coast of Alaska, however, is not susceptible to extensive agriculture on account of rough topography, a wet climate and poor soil conditions, and something else to insure permanency in settlement must be used in place of it. Fishing and mining, which now support the bulk of the population will always be highly important industries, but are too seasonal and unstable for this purpose. The extensive timberlands of the National Forests can, however, fill this position admirably provided the timber is handled as a crop and not as a mine. The Forest Service proposes to manage these timberlands on the crop system and thus have them serve in the above mentioned capacity. Norway, Sweden and Finland are thriving countries in which the forests through intensive management make up for a deficient agriculture. A Swedish forest expert has written: "It may be said that the position of Sweden as an independent nation and as a civilized country is contingent upon the existence or nonexistence of its forests." These countries lie in the same latitude as southern Alaska, have the same land-use problems and produce about the same class of forest products. While the forests of Alaska can produce many different kinds of timber products and are at present supplying the needs of a considerable local lumber industry, their chief (*Continued on page* 483)

The way forest officers must cover their districts in these "maritime" forests in Alaska—going ashore from the Forest Service launch *Ranger* on the Tongass National Forest

The Mule Express

By John C. Frohlicher

"The mule, he is a funny sight,
He is all ears and dynamite,
He has a lovely voice to sing
And makes a noise like everything.
Some folks don't treat mules with respect,
They say they ain't got intellect—
The mule, he tends to his own biz;
He don't look loaded, but he is."

DUSK comes down on the Flathead, the plaintive call of a screech owl alone accentuating the stillness. The chuckle of Spotted Bear Creek as it melts into the South Fork is almost unheard. In the tents lights are gleaming, and the last packer has long since fed his beasts and left the corral.

All is quiet. Then, just as the Montana moon crawls into the sky, a lusty bray breaks the peace. Men still their tongues around the gleam of the campfire until a soft curse slips from those lacking control. The tall form of the boss of the Flathead is seen, reluctantly leaving to their repose the most despised, but among the most important "tools" in National Forest administration—the long-eared creatures of the mule express.

For mules, anathema of rangers and guards on the National Forests, are the chief means of transportation on many of these forests. With the necessity for a large number of men on the forests during the fire season, the inaccessibility of these men and the vast amount of supplies needed, a hit-or-miss system of packing cannot be used. If a lookout, ranger, or firefighter is without tobacco, coffee, or even his mail, he is a discontented human being. The mule packs in whatever is necessary for his peace of mind and body. He packs the men themselves into the forests, he keeps them supplied with food and other essentials, and when the first autumn rains spell the end of the fire season—or when the fire-protection appropriation runs out—the mule packs them out of the forests.

So far as is known, the first animals bought by the government for the National Forests of the Northwest came in 1907 or 1908, when Jack Clack brought eight head of horses to the big prairie. It was planned then to raise the necessary pack stock, but this plan fell through.

Horses in that day were worth about ten dollars each, the better class being used for saddlers or buggy teams. The pack animal was an Indian cayuse, as a rule, and consequently could be had for a song—even an off-tune song. In all probability that first bunch of stock cost Uncle Sam not in excess of $150, for at least two of the animals were big horses.

But in 1929 the Forest Service had 806 mules and 523 horses to its name in the Northwest. The average cost of the horses is hardly obtainable, since they came from all sources and the original costs of the beasts have long since been charged off. But the mules cost about eighty dollars each. This means that mule power alone represents an expenditure of $64,480. The cost of rigging a mule, providing the blanket, saddle with breast band and breeching, halter and nosebag is about forty dollars. This entailed an original expenditure of about $32,000. It is safe to say

that the total cost of the equipment for the mule express is not far short of $100,000.

The mule may appear to be a pampered pet when one compares his status with that of the packhorse in other days. The packhorse was turned loose to rustle his food, after traveling twenty miles over a poor trail, carrying a pack of 200 pounds. The mule travels over a good trail from seventeen to twenty miles, and then is fed from a nosebag. He is given a lot of hay, too, before he is turned out to graze. But the increase in pack stock numbers means that the grass has been eaten from the administrative areas and other pasturage. Even the lowly horse today gets his ration of oats and hay before he heads for the higher ridges.

Almost any young forester learned to pack a horse in the early days. But mules—well, mule packers are born, not made, and the embryo packer today soon learns what is safest for him

The mule has one particular trait that does not endear him to the packer. He can hide out better than a trainman who does not want to be called. Packers annually lose many days hunting their stock, and occasionally it happens that a fire crew goes to bed hungry because the mule express has been sidetracked somewhere.

Mules do most of the district packing where they are found on a forest. They usually take in all the supplies to wilderness areas, and, so far as their numbers are adequate, care for the fire season. But the mule express does not bear the entire brunt of the packing. At least, not in emergencies. And the season of 1929 was an emergency.

With humidity and moisture conditions bad, the fires got a good start in the forests. And with thousands of firefighters in the woods, it was necessary to have a service of supply that was adequate. All available mules in the district were sought, but these were inadequate. Then the foresters remembered their first loves, and the call went out for packhorses.

During the season the Forest Service hired 2,000 extra pack animals—all horses. These horses packed bedding and food, pumps and gasoline, axes and mattocks, tobacco and medicine to the fire crews. They worked a total of 45,000 horse days, and they cost, in rental, $35,629. The costs of shoeing, transporting and feeding the animals brought the total to $80,000—a large amount to spend on the oldest form of horse transportation in a day of motor vehicles. Just as railroads at times are forced to call out all available power and cars to handle an increase in business, so the Forest Service was compelled to add to its motive power. And the horse will be used in emergencies in the future.

But the number of skilled packers is no longer large—at least not as large as it was between 1910 and 1920. In a small way this may be blamed on the mules. Almost any young fellow who went into the forests during those halcyon years learned to pack a horse. The old reliable permitted indignities on the part of greenhorns that would not be tolerated by any other form of beast. The young fellows learned how to cargo, how to saddle, how to throw a diamond hitch.

But mules! Well, mule packers are born, not made. Kicks often greet the embryo packer, and the average youth soon learns what is safest for him. So only the regular packers monkey around the beasts. The long-eared express has some efficient engineers, however. They have to be efficient, or they go to a hospital.

In the old days good horse packers were plentiful. Most of them returned year after year, and some were so permanent they were figured among the assets on the inventory. But when the mule came in, a new crew of wranglers was necessary. The old heads couldn't stand the mules. They are now found somewhere out in civilization, cursing the animals that chased them from their jobs.

The new packers soon developed an aristocracy—the aristocracy of the mounted men. They were better than smokechasers and rangers and lookouts. They admitted it, even though the lesser lights frequently rounded the mules up. Packers' heels are too high to allow much walking. Anyway, a smokechaser should have practice looking for mean things, like fires and mules, the packers reasoned.

The old heads, of course, resent the present position of the mule. But the mule, to quote Forest Service officials, is "a better tool." Transportation has become the greatest problem in adequate fire protection and administration of the National Forests; and it follows that the best means of transportation will be used wherever possible.

Trails have been improved, not to make the job of the mule express easier, but to shorten the distance between points. The mule is a faster walker than the packhorse. Too, as a rule, he will follow a leader, usually an old white bell mare. The packhorse often had individual ideas about where he belonged in the line of march, or about short cuts and sidings. The mule is a tougher beast, not so susceptible to ailments—though when he does get sick, he might as well be shot.

But he is not beloved, except, perhaps, by his packers. His cheerful song affronts the ear of the average lookout. His craftiness in hiding out when he is wanted is the bane of many a smokechaser's life. And he isn't good at the logging and trailmaking jobs. Also, he has a decided tendency to bog down whenever a trail is muddy, especially with a capacity load.

The horse displaced the old man-pack idea in the forests. The mule displaced the horse. Good roads and motor cars have displaced the mule for long hauls, but it is doubtful if grub and tools and fire crews can be brought into all the places on the forests via the airplane route. In those places the mule will still be the means of transportation, and, being a long-lived brute, he is assured of many years of hard work in summer and fair grazing in winter.

But when long-quenched forest fires are revived in the talk of evening, when smokechasers and guards and packers arrive at a common level of fellowship, when men discuss the things closest to their hearts over their glowing pipes, good words for the mule will be few and far between. Only his packer will stand up in meeting for him, and then only if the long-ear has been tractable the past few trips.

But it is probable that some old timer, who has worked many summers as a temporary guard, will think, as he reads the paper the mule express brought in that day: "Mail gets in oftener than it did before the mules came here." And maybe some faint thought that the mule, too, is protecting the forests, may be mentioned. But not if the beggar brays!

Photograph by K. D. Swan

The horse displaced the man-pack in the National Forests, and the mule is displacing the horse, chiefly because he is a faster walker and not so susceptible to ailments

The Ranger's Boss

By Julia T. Shinn

DON'T misread the title: It is not the possessive case, but mere elision—the ranger is boss.

In 1902 we drove our buckboard from Fresno to Northfork on the old Sierra Reserve in California, and the next day, after finding out all we could about possible places to live, drove over a rough woods road to look at an empty cabin. I'm not sure whether it was the stone chimney or the big black oak overshading that three-room dwelling that captured us, but in spite of dirt and dilapidation, in spite of broken fences, calves on the front porch and rats scurrying across the floor, it looked possible to us, and we decided to buy the quarter section that it stood on.

The first need was of a thorough cleaning, and for the hardest of that an Indian was engaged. His greeting to me when I met him at the door, ready with careful instructions, was: "Where boss?"

Meekly directing him to my vastly amused husband, I then and there accepted the status of a mountain woman, and what's more, we named the little house "Peace Cabin."

Twenty-eight years ago, life was simple and hard in the hills. We were fifty rough miles from the big valley. Uncle Sam had not inaugurated parcel post, there were no freight lines and the passenger stage that came twice a week rather unwillingly brought packages. So, unless we could make them ourselves, we had to do without a number of things our world had hitherto been full of. Muscle and originality were at a premium, and when did a woman have a surplus of the former? What we women had to develop was general adaptability. No doubt at all, each ranger in his own bailiwick, was boss.

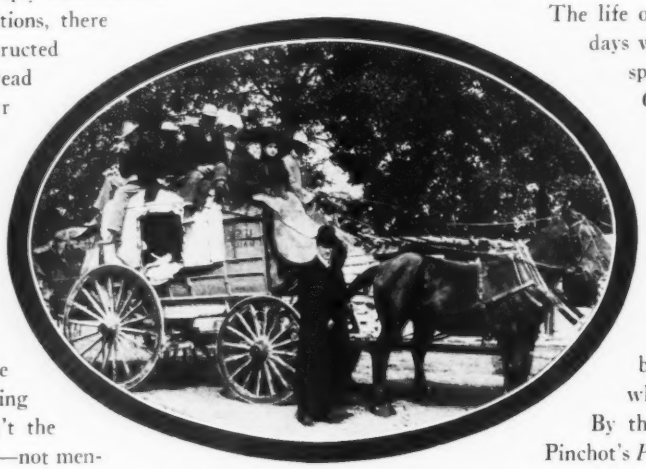
Charles Shinn and his wife—standing at the doorway of "Peace Cabin." From 1902 to 1923 is a long trek over pioneer ways, but these two traveled it happily together in "the Service"

But his woman stood shoulder to shoulder with him. His interest and enthusiasm in his work became hers too. That was why the Spirit of the Sierra passed into legend, and why it was, and still is, no legend at all.

One thing the early ranger woman learned to do and to help her man do was to laugh. If the Christmas turkey, all dressed and carefully packed, was left at the edge of the foothills because the roads were too heavy for the stages to bring any packages for a week, we laughed and opened cans of oysters. If a request for good fire-fighting tools, forwarded to Washington, brought the reply that records showed the Sierra to have sufficient tools, we laughed and made or bought our own tools. We could even see that Washington thought it was right. Records are grand things, and how was a recording clerk to know that fire tools wore out, that rangers on those first Forest Reserves were appointed only for the summer, that there was not such a thing as a tool cache, a tool house, or even a tool receipt?

Once, a month-end report of free timber permits was scathingly criticized because cedar post timber had been granted an applicant where no cedar could be. The timber on that area had been estimated two years earlier; and since that date timber had been given away up to the total amount estimated. We read the letter and laughed till we cried, for we knew there were oodles of cedar trees there. There still are—marvelous ones that gleam red when the last sunbeams shine through the boles of the tree on a late August afternoon. Again it was a case of records against facts. No wonder we drew a deep breath when district offices were

established. San Francisco was only two days away; a personal visit was not impossible, and facts could be explained *viva voce* that never could be made clear with a typewriter. No longer, as in earlier days, were questions, requests, reports, explanations, "dropped into a well." If the excellent instructions in the manual simply could not be applied to California conditions, there was a chance for a reconstructed manual, and we women, instead of having to shrug our shoulders and say with the immortal Bunner, "Rats, what's the difference!" could talk over with our rangers the advisability of recommendations for changes; or even—what was perhaps better for our souls—discover that we were in the wrong. But bracing up her special ranger wasn't the only job a ranger's wife had—not mentioning such minor details as cooking, sewing and the like routine. We became, by dint of reading, and of trial and error, pretty fair nurses. We helped each other if any of our men or children were sick, and we did our best for the Indians. The trust given any decent white neighbor by an Indian was appalling. There was an old doctor of sorts who was commissioned to look after the ailing Indians of our region. One morning my Indian washwoman brought me this note from him: "Dear maddam, Emma's boy is sick—nothing catching, jest his livver out of order. These powders are mild, mostly podofleen, but Emma she won't give them to him til you say they are alright." Again, an Indian woodchopper came to our kitchen door one Sunday. "My arm pret' dam sick," he explained. "I scratch 'em rusty nail. Hurt like hell. What I do?" When our Indian "patients" recovered—largely through quiet, a restricted diet, if, in case the trouble was internal, plenty of clean, hot water, and iodoform if it was external—we heaved a sigh of relief, for we had been told that if one of them died the family would hold us responsible.

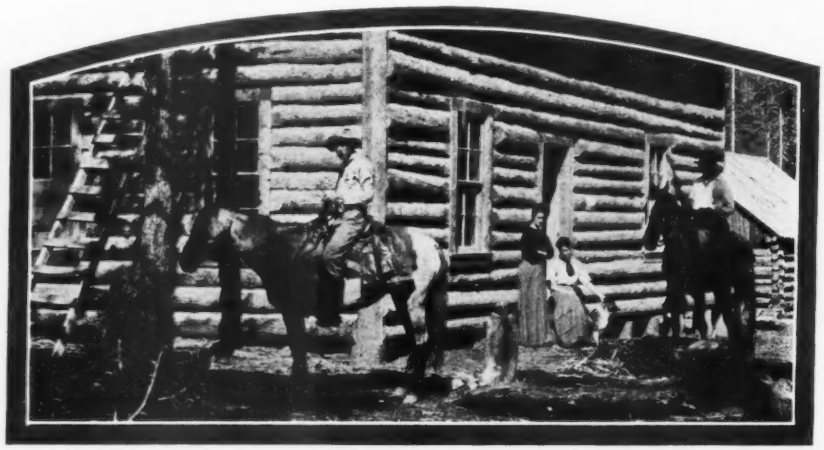


Typical of the stagecoaches in use in the early days of the Forest Service, and on which the early rangers and their wives had to depend for mail and merchandise

The women would bring us their baskets to take care of while they went to the San Joaquin Valley to pick grapes; they would invite us to name their babies and to do errands in town. What had all this to do with the forests? A lot, for it was the Indians on whose labor we largely depended for fire-fighting, and it was mighty good forest policy to have them for our friends—aside from the plain humanity of it all.

The life of women in the early forest days was not all doing without responsibility, and difficulties. One big advantage was time. Winter evening time, I mean, for, of course, summers were one long, tense strain of fire, without roads, trails, telephones, lookouts, or maps. But winter evenings—why, that winter of 1902 we read Gibbon's *Decline and Fall*, the whole ten or twelve volumes. By the following winter we had Pinchot's *Primer of Forestry* and Roth's first book, and we'd had a summer in the forests that gave us a basis for study of forest botany and forestry practice. We even had time to read poetry and essays and religion, and to begin to acquire the *Saturday Evening Post* habit that has since become so nearly universal in the Service. Religion really meant something when we read sermons because we wanted to, and when a friend began sending us the printed sermons of Dr. Charles R. Brown, then pastor of the First Congregational Church, of Oakland, California, and the mother of one of us supplied a little folding melodeon of the sort the Salvation Army uses on street corners, we were "all set" for Sunday afternoons. Seth Parker and Ma don't sound at all unreal to those of us who gathered around that little organ on Sierra winter Sundays. Later we took it up to the summer camp, where, under the great firs and sugar pines, it held choruses to the key at the camp fires. As the sense of permanence in the Service grew, books were accumulated in the camps and circulated from cabin to cabin, making many an evening delightful. A splendid girl who gave up a business position in San Francisco to marry a ranger, cooked for a trail crew one

(*Continuing on page* 481)



In those early days, each ranger was "boss" in his own bailiwick, but—his woman stood shoulder to shoulder with him

"June Eleventh" and the Homestead Hysteria

(*Continued from page* 411)

able for agriculture." The information gained by the trial efforts in classification conducted by Forest officers in the latter half of 1906 demonstrated to the Service that the volume of work would be much larger and the work itself much more difficult than anyone had anticipated; also that in order to get prompt action upon applications and avoid hardship to the legitimate homeseeker, it would be necessary to speed up the work. To secure this, the activity was decentralized and placed under the Chief Inspector in each of the six western National Forests districts.

The writer was then Chief Inspector of District 1. The western part of this district was the center of the political storm which, under the leadership of Senators Heyburn of Idaho and Carter of Montana, raged ruthlessly around the "forest homestead" and the woes of the persecuted "homesteader." To meet this situation the June 11 work was organized upon the theory that it had to solve, not a problem in forestry, but a practical problem in local land economics which involved forestry and forest values as only one of several factors. So, while forest school graduates—or in other words, Senator Fulton's "dreamers and theorists"—were inducted into National Forest administration, they were not used to any extent on June 11 work in that region. The first fourteen Forest officers assigned exclusively to June 11 examinations in Montana and northern Idaho following Leavitt's assignment to the Kaniksu, were nontechnical men and every one of them was a citizen of the district. The tenderfoot of the group had lived in the district over eleven years. Some of these men were born and raised in the district and some had been homesteaders themselves. Among this group were such men as Roy Headley, now Assistant Forester in the Washington office; T. C. Spaulding, now Dean of the School of Forestry of the State University at Missoula, Montana; John D. Jones and Glen A. Smith, the former now Assistant District Forester at Albuquerque, New Mexico, and the latter now Assistant District Forester at Missoula, Montana; R. P. McLaughlin (deceased), Forest Supervisor and for years State Forester of Montana; Ralph Bushnell (deceased), Forest Supervisor; C. E. Schoonover (deceased), Forest Supervisor; C. B Swim, now Assistant Supervisor of the Gallatin National Forest; and W. S. Daugs, now a District Ranger on the St. Joe National Forest.

The present Chief of the Biological Survey, Paul G. Redington, then a Forest Inspector in District 1, in connection with his inspection of the Shoshone National Forest was given the task early in 1907 of reporting on a number of treeless areas along the highway leading from Cody, Wyoming, through the Forest to the eastern entrance of the Yellowstone National Park. At a distance of twenty-three years after the event it is interesting to recall that he had the vision to recommend the rejection of these applications, basing it upon the grounds that the areas were not in fact "chiefly valuable for agriculture" but were chiefly valuable for their strategic location to the Park, the Park entrance, and to Park travel, and that public interest in the Park required that these key areas be kept under public control. His conclusions were submitted to Congressman Mondell, who approved their soundness and stated that the forest homestead law was never intended to apply to such lands.

The limits of an ordinary volume would be insufficient to include the high lights of the June 11 work in each of the six districts. Paul D. Kelleter, now Director of Conservation in Wisconsin, must be credited with important classification work in the Black Hills. T. W. Woolsey, Jr., now of the Yale School of Forestry, and C. J. Stahl, now Assistant District Forester at Denver, Colorado, were among the early examiners in the Southwest. Chief Inspectors Smith Riley and R. E. Benedict made contributions comparable to that already credited to the other chief inspectors. By the time the districts were organized as administrative units in the fall of 1908 the work was well in hand in all regions. Lands actually agricultural were being promptly opened to entry and applications for lands unsuited for farming were being promptly rejected.

There is something of a halo of romance surrounding the homesteader. For the real ones we have an admiration and respect that is almost devotional in its intensity. There *were* some real ones and to them the June 11 examiner proved a friend and helpmate.

The story of the other class, however, has a strong tinge of "romancing" rather than romance. Every conceivable variety of plausible excuse was offered as the real reason for the applicant's seeking heavily timbered land. The most common excuse was: "I intend to log this timber myself, sell the logs, and use the cash to buy powder to blow out the stumps." The applicant for 160 acres of cedar averaging 100,000 feet to the acre insisted: "I am not after the timber. This land is an ideal site to grow ginseng; it is worth $2,000 an acre for that purpose. I would not dream of selling the timber or allowing it to be cut." The applicant on a steep mountain side covered with heavy Douglas fir said: "I plan to establish a home for boys. I am going to have goats feed on the mountain side here, and I am going to instruct a school of boys in the art of building boats by hand out of the lumber that we will make from these trees with a small portable mill." The applicant for a piece of bench land with a heavy stand of pine worth $100 an acre asserted: "I am sorry the timber is on this land; it is really in my way. I want to plant apple trees here and make of it an orchard worth a thousand dollars an acre."

So much for the timber. There was always a plausible excuse for seeking to secure under the forest homestead law any particular piece of land clearly having special value for some purpose other than farming. It was simply amazing what rich agricultural soil surrounded valuable medicinal springs, attractive lake shores, good water-power sites, and other areas having strategic key-site values! (*Continuing on page* 480)

Who's Who in the

Arthur M. Hyde

Arthur M. Hyde, secretary of the Department of Agriculture, under whose department the National Forests are administered, through the Forest Service, is a Missourian and served his State as governor from 1921 to 1925. He is a graduate of the University of Michigan and the Iowa State University and practiced law at Princeton, Missouri, for many years, serving also as mayor of that city.

R. Y. Stuart

R. Y. Stuart, has been Chief Forester of the United States Forest Service, since 1928. Graduating from the Yale Forest School in 1906 he entered the Forest Service and remained until 1920 when he resigned to become Commissioner of Forestry and Secretary of Forests and Waters of Pennsylvania. He returned to the Service in 1927 as assistant forester, in charge of public relations.

E. T. Allen

E. T. Allen is truly a pioneer in the National Forest movement as well as in forestry work. Entering the federal service in 1898 he has devoted thirty-two years to government, state and private forestry, twenty years of which has been given to the development of the Western Forestry and Conservation Association, Portland, Oregon, of which he is forester and executive secretary.

Raphael Zon

Raphael Zon, director of the Lake States Forest Experiment Station, at St. Paul, Minnesota, and professor in forestry at the University of Minnesota, has served the government since 1901. Born in Russia, he studied at the Imperial University, at Kazen, before receiving his degree at Cornell University. He originated and developed forest research in the United States.

J. W. Nelson

J. W. Nelson, broncho buster and showman for Buffalo Bill, friend of Annie Oakley and Death Valley Scotty, is perhaps the most colorful man in the Forest Service today. He was a guard on the old Yellowstone Reserve in 1900 and ranger through the pre-Forest Service days, becoming chief of grazing at Denver in 1905. Today he is chief of range management in California.

Roy Headley

Roy Headley, in charge of operations for the Forest Service at Washington, D. C., since 1919, was appointed as a forest ranger in Idaho in 1907, and served a number of years in the West in various positions. An executive and organizer of unusual ability he has been an important factor in perfecting the operation plan of the National Forests. He is a graduate of the University of Idaho.

Will C. Barnes

Will C. Barnes, author, soldier and stockman, has served the Forest Service since 1907 as assistant forester in charge of range management. In 1881 he was awarded the Congressional Medal of Honor for bravery in action against the Apache Indians. He was a member of the Arizona legislature in 1891 and 1892. In 1929 he became secretary of the National Geographic Board.

E. A. Sherman

E. A. Sherman, associate forester of the Forest Service since 1920, first entered the service in the West in 1903. He was supervisor of six National Forests before coming to Washington where he has played an important and active part in shaping the policies of the government forests. He is a graduate of the Iowa Agricultural College and claims both Montana and Utah as his home states.

Paul G. Redington

Paul G. Redington, Chief of the United States Biological Survey since 1927, began his association with the Forest Service in 1903. He served as district forester in New Mexico from 1916 to 1919, when he was transferred to California. In 1927 he came to Washington, D. C., as assistant forester, in charge of public relations. He is a graduate of Dartmouth University and the Yale Forest School.

Julia T. Shinn

Julia T. Shinn is one of the most beloved characters in the history of the National Forests. As the wife of Charles Howard Shinn, one of the pioneer supervisors in the early days, she "stood shoulder to shoulder with her man" in working out their many problems. She was appointed a member of the Forest Service in 1907 and worked devotedly until 1923. She is a native of California.

National Forest Number

Aldo Leopold

Aldo Leopold, one of the foremost foresters in the country, has had wide experience in game administration. A graduate of the Yale Forest School, he served the Forest Service from 1912 to 1928, four years as associate director of the Forest Products Laboratory, resigning to undertake a survey of game resources for the Sporting Arms and Ammunition Manufacturers' Institute.

L. F. Kneipp was a forest ranger in 1900, serving for five years before the Forest Service was created. Since 1928 he has been principal administrative officer in charge of the Branch of Lands of the Forest Service, at Washington, D. C. He is charged with the responsibility of acquisition and classification of National Forest lands, and their recreational and other uses. He comes from Arizona.

L. F. Kneipp

John W. Lowell

John W. Lowell is one of the picturesque old-timers of the Forest Service. Born in Utah, he gave his early years to punching cattle. He became a forest ranger in 1904, before the establishment of the Forest Service, and played a big part in winning the forest range for the Service. In 1917 he became a forest supervisor and today is boss of the Bitterroot National Forest in Montana.

J. A. Fitzwater, forest inspector in the Office of Forest Management of the Forest Service, at Washington, D. C., entered the Service following his graduation from the Yale Forest School in 1908. He served for several years in the West as forest supervisor and as assistant chief of forest management, coming to Washington in 1926 as a forest inspector. He is a native of Pennsylvania.

J. A. Fitzwater

A. C. McCain

A. C. McCain, forest supervisor of the Teton National Forest, in Wyoming, is another old-timer who entered the Forest Service via the cowboy route. Appointed a forest guard in 1905, he became assistant district forester in charge of operations at Ogden, Utah, in 1908. In 1918 he was appointed to the Teton, one of the most rugged wildernesses in the country. He is a native of Illinois.

Wallace Hutchinson, in charge of Public Relations in the California region of the Forest Service, is the originator of "Ranger Bill," whose sayings epitomize the philosophy of the National Forest field force. Graduating from the Yale Forest School in 1903, he saw the pioneering work of the Forest Service in the Middle West, on the Pacific Coast and in the far-away Philippines.

Wallace Hutchinson

H. F. Heintzleman

H. F. Heintzleman has seen service in Alaska for the Forest Service since 1921. Appointed in 1910 as a forest assistant following his graduation from the Pennsylvania State Forest School and Yale University, he served in the continental United States as forest examiner and forest supervisor. Following a year of investigations he was made assistant district forester in Alaska in 1922.

Joe B. Halm entered the Forest Service as a ranger just in time to go through the greatest adventure of his life—the great forest fire in the Pacific Northwest of 1910, in which he and his party were given up for lost. An artist and photographer of great merit, he was assigned to the engineering department at Missoula, Montana, in 1913. He is a graduate of the Washington State College.

Joe B. Halm

W. V. Mendenhall

William V. Mendenhall, forest supervisor of the Angeles National Forest, in California, played as a boy in the domain he now rules over. His dreams of serving the mountains near his Pasadena home were realized when he was appointed a ranger in 1911. Later he became supervisor of the Santa Barbara National Forest, returning in 1929 as supervisor to his boyhood love—the Angeles.

William L. Barker, Jr., pioneered the Superior National Forest in Minnesota, writing its recreation policy. He is a Hoosier and a graduate of Purdue University. **John C. Frolicher** is Secretary of the Montana Sportsmen's Association, and educational secretary of the Montana Fish and Game Commission. **Philip W. Ayres,** of Boston, is forester for the Society for the Protection of New Hampshire Forests.

W. L. Barker

"T. R."—Trailblazer

(*Continued from page* 390)

velopment of irrigation and forestry during the next seven and one-half years. It set forth the new attitude toward the natural resources in the words: 'The Forest and water problems are perhaps the most vital internal problems of the United States.' . . .

"When I became President, the Bureau of Forestry (since 1905 the United States Forest Service) was a small but growing organization, under Gifford Pinchot, occupied mainly with laying the foundation of American forestry by scientific study of the forests, and with the promotion of forestry on private lands. It contained all the trained foresters in the Government service, but had charge of no public timberland whatsoever. The Government forest reserves of that day were in the care of a Division in the General Land Office, under the management of clerks wholly without knowledge of forestry, few if any of whom had ever seen a foot of the timberlands for which they were responsible. Thus the reserves were neither well protected nor well used. There were no foresters among the men who had charge of the Government foresters.

"In my message to Congress I strongly recommended the consolidation of the forest work in the hands of the trained men of the Bureau of Forestry. This recommendation was repeated in other messages but Congress did not give effect to it until three years later. In the meantime, by thorough study of the western public timberlands, the groundwork was laid for the responsibilities which were to fall upon the Bureau of Forestry when the care of the National Forests came to be transferred to it. It was evident that trained American foresters would be needed in considerable numbers, and a forest school was established at Yale to supply them. . . .

"The result of all the work outlined above was to bring together in the Bureau of Forestry, by the end of 1904, the only body of forest experts under the Government, and practically all of the first-hand information about the public forests which was then in existence. In 1905, the obvious foolishness of continuing to separate the foresters and the forest, reenforced by the action of the First National Forest Congress, held in Washington, brought about the Act of February 1, 1905, which transferred the National Forests from the care of the Interior Department to the Department of Agriculture, and resulted in the creation of the present United States Forest Service.

"The men upon whom the responsibility of handling some sixty million acres of National Forests lands was thus thrown were ready for the work, both in the office and in the field, because they had been preparing for it for more than five years. Without delay they proceeded, under the leadership of Pinchot, to apply to the new work the principles they had already formulated. One of these was to open all the resources of the National Forests to regulated use. Another was that of putting every part of the land to that use in which it would best serve the public. . . . .

"The principles thus formulated and applied may be summed up in the statement that the rights of the public to the natural resources outweigh private rights, and must be given its first consideration. Until that time, in dealing with the National Forests, and the public lands generally, private rights had almost uniformly been allowed to over-balance public rights. The change we made was right and was vitally necessary; but, of course, it created bitter opposition from private interests.

"One of the principles whose application was the source of much hostility was this: It is better for the Government to help a poor man to make a living for his family than to help a rich man make more profit for his company. . . .

"Another principle which led to the bitterest antagonism of all was this—whoever (except a bona-fide settler) takes public property for private profit should pay for what he gets. In the effort to apply this principle, the Forest Service obtained a decision from the Attorney-General that it was legal to make the men who grazed sheep and cattle on the National Forests pay for what they got. . . .

"Up to the time the National Forests were put under the charge of the Forest Service, the Interior Department had made no effort to establish public regulation and control of water powers. Upon the transfer, the Service immediately began its fight to handle the power resources of the National Forests so as to prevent speculation and monopoly and to yield a fair return to the Government. . . .

"In 1907, the area of the National Forests was increased by Presidential proclamation more than forty-three million acres—and the really effective management of the enormous area of the National Forests began to be secured. . . .

"By this time, also, the opposition of the servants of the special interests in Congress to the Forest Service had become strongly developed, and more time appeared to be spent in the yearly attacks upon it during the passage of the appropriation bills than on all other Government bureaus put together. Every year the Forest Service had to fight for its life.

"One incident in these attacks is worth recording. While the Agricultural Appropriation bill was passing through the Senate, in 1907, Senator Fulton, of Oregon, secured an amendment providing that the President could not set aside any additional National Forests in the six northwestern states. This meant retaining some sixteen million of acres to be exploited by land grabbers and by the representatives of the great special interests, at the expense of the public interest. But for four years the Forest Service had been gathering field notes as to what forests ought to be set aside in these states, and so was prepared to act. It was equally undesirable to veto the whole agricultural bill, and to sign it with this amendment effective. Accordingly, a plan to create the necessary National Forest in these states before the agricultural bill could be passed and signed was laid before me by Mr. Pinchot. I approved it. The necessary papers were immediately prepared. I signed the last proclamation a couple of days before, by my signature, the bill became law; and, when the friends of the special interests in the Senate got their amendment through and woke up, they discovered that sixteen million acres of timberland had been saved for the people by putting them in the National Forests before the land grabbers could get at them. The opponents of the Forest Service turned handsprings in their wrath."

THE Champion Fibre Company, subsidiary of The Champion Coated Paper Company, Hamilton, Ohio, reforests extensively in the 150,000 acres of its pulp lands in North Carolina. Over two million trees are put out every year.

Winning the Forest Range

(*Continued from page* 400)

States of America, and by that same token he meant to uphold it.

The owner had but to raise his hand and 250 men—herders, camp-tenders, packers, cooks, lambing boys—would be at his side, ready to wipe from the face of the world this golden-haired, blue-eyed young stripling who was defying the lightning. But Don Solomon Luna was wise in his generation. He did not carry for naught the name and countenance of the greatest king of Israel. He knew that behind this Washington inspector and his ever-present "Use Book" was one Gifford Pinchot; also that back of him was another, even greater and more powerful, and one who loved not sheep nor their ways any too well—a man affectionately known as "T. R." It was a time for diplomacy and tact.

Mr. Luna gave orders for his herds to be held up along the forest boundary and drove a team to death to reach the telegraph at Magdalena, forty miles distant. The wires fairly sizzled with his messages to Washington. The lean chieftain of those days was equally wise in his generation. He loved a fight, but peace even more. He repeated the appeals from New Mexico to his chief of grazing. "It's up to you," he told Potter. "Issue your orders direct as to admitting or refusing entrance to the sheep." It didn't take Potter a minute to decide. A hundred thousand dollars worth of lambs could not be sacrificed for a paragraph in the Use Book.

A few days later the flocks of Don Solomon were peacefully feeding upon their lambing grounds within the forest. Hundreds of wobbly-legged little lambs were lying round in the bright sun. The effect of this decision upon the stockmen of the West was magical. "This man Pinchot, he's almost human," they said to each other. They knew that common sense and reason were to govern their dealings with this new activity of the federal government. Nor were they mistaken.

Those first few years of the new Forest Service were eventful ones for the forest officers in charge of grazing. Never in the history of the world had any government undertaken to regulate the use of 150,000,000 acres of public land by probably 10,000,000 sheep and 3,000,000 cattle. There were no precedents to guide them, no rules to follow. Theirs was an entirely new job. They were pioneers who were forced to build up day by day their system of regulated grazing from the very foundation. They met each problem as it came. Each day brought new ones. A rule that was sound in the pine-covered plateaus of Arizona wouldn't work in the Cascades of Oregon. They made mistakes, but were quick to admit and profit by them. For fifty years or more the western stockmen had used these ranges as their own. Inside of half a dozen years they were under almost absolute control. Worn-out ranges began to grow grass, the bare hillsides were covered with verdure. Stock began to leave the ranges in the fall, fat and marketable, a thing they had not done for several seasons.

For the first few years the bulk of the forest rangers were men of this same character. They had little knowledge of forestry, but they knew the livestock business from the ground up. They were admirably suited for pioneers in paving the way for the later class of forest rangers, young men educated and trained for this work, who have to a large extent taken the places of those old-timers of the early years of the Service. It was James T. Jardine, another Idaho cowboy who punched cows summers that he might go to college winters, who pulled off his chaps and came to the Washington office in 1908 and laid strong and deep the foundations for what we know today as the grazing studies side of the work.

These youngsters in the work who are now coming from the forest schools may not know much about a diamond hitch, the respective merits of a double-rig versus a single-rig saddle, how to make sourdough bread, flank a calf or dip a sheep. They do, however, know all about trees, plants, grasses and their forage value, the effects of denuding a mountainside of its forage cover and such matters. Moreover, what they lack of the old-timers' knowledge and practical range experience can be gained under the keen eye and friendly supervision of one of the older men.

Volumes could be written of the adventures of the early grazing men. Often it took real nerve to carry out orders and enforce the regulations.

The story of how, in July, 1917, Supervisor Billy Kreutzer of the Gunnison National Forest, in Colorado, unarmed and unafraid, faced and turned back a score of drink-crazed fully armed cowmen, determined to raid a sheep camp on his forest, is as thrilling as any Wild West story ever written. Or the desperate attack on Ranger Kirby of the Crook National Forest, in Arizona, by a crazy prospector 300 feet back in the black darkness of an old mining tunnel. Another thriller is the story of the ranger on the Datil Forest, in New Mexico, who strolled round the corner of a cabin in some thick cedars and found himself facing a six-shooter in the hands of a notorious cattle thief busy skinning a yearling that didn't belong to him. An adventure indeed, but he rode back to Socorro with the man a prisoner.

Nor were they all serious matters. When the first ten-year permits were offered the stockmen, one old pioneer in Montana sent his ten-year permit back with the following letter:

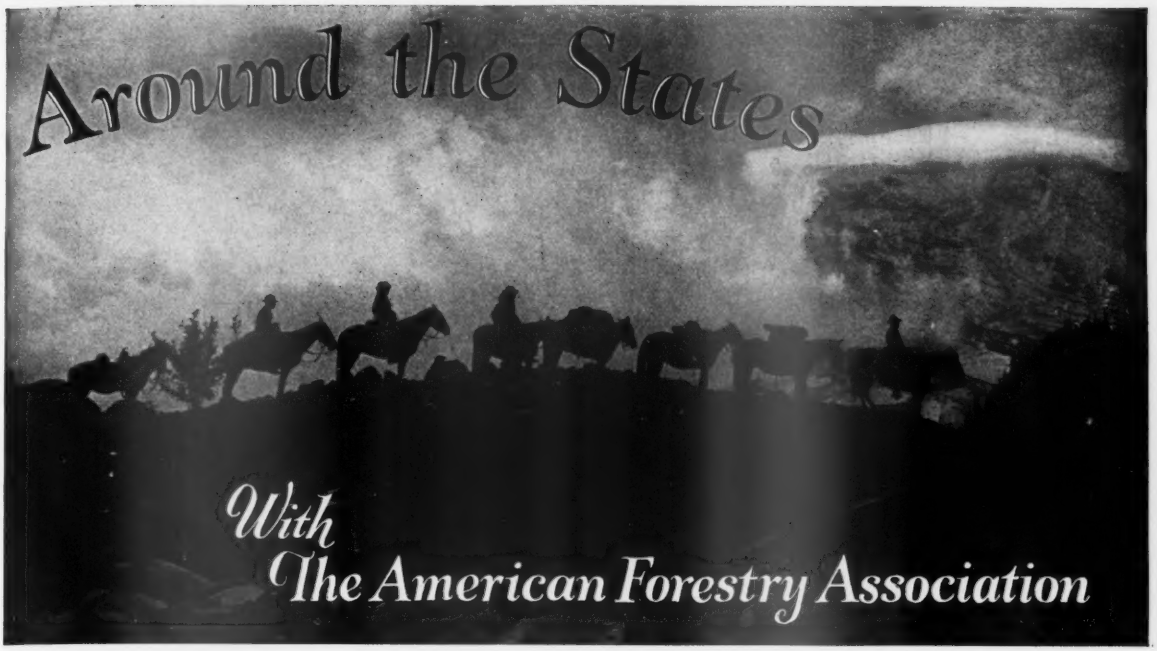
"Dear Mister Supervisor:

I don't want no permit for ten years, 'cause I'm seventy-two years old and I calculate I can't live ten years nohow. Send me one for a year and see what happens."

Then there was the persnickety June 11 settler, who sent the patent for his forest homestead back to the supervisor in a California forest with the comment:

"This here paper is signed by Mr. Taft. Out this way deeds to real estate has got to be signed by the wife, or it ain't legal. Please send it back to Washington and get it signed by Mrs. Taft."

Them were the happy days!



Increase Forest Road Program

On May 23rd, President Hoover submitted to Congress supplemental estimates of appropriations for the Department of Agriculture, including $3,500,000 with which to carry out the enlarged program of forest road and trail construction made possible by the passage and approval of the Colton-Oddie Bill on May 5, 1930. This act authorizes appropriations for constructing forest roads and trails and increases appropriations for this purpose $5,000,000 over those of previous years. The Department of Agriculture has estimated that during the year 1931 expenditures for forest roads and trails will amount to about $11,000,000. The estimate of $3,500,000 provided in the President's supplemental estimate will be added to an appropriation of $7,500,000 included in the regular Agricultural Appropriation bill giving a total available sum of $11,000,000.

National Forest "Regions"

The nine National Forest districts maintained in the field organization of the United States Forest Service are hereafter to be known as "National Forest Regions." The Secretary of Agriculture has approved the change in terminology.

District foresters in charge of the various "regions" will be "Regional Foresters," and other officers of general administration in these areas will be known as "Assistant Regional Foresters.

The Forest Service made the change because of the confusion resulting from the use of the word "district" in differing connections. The National Forests are divided into "ranger districts," and the forest units comprised in several state forestry organizations also are called "districts." It was also believed that the word "region" is more distinctive and appropriate in designating the Forest Service's extensive administrative areas.

Alaska Newsprint Progress

The timberlands of southeastern Alaska under silvicultural management can produce 1,500,000 cords of pulpwood every year and be fully renewed through tree growth, according to a statement recently submitted to the Senate by Secretary Wilbur of the Department of the Interior, pursuant to Senate Resolution 212, directing such a report. This crop of pulpwood might be converted into a million tons of newsprint, or about one-fourth of the present annual consumption in the United States.

The report includes statements from the Governor of Alaska, George A. Parks, and from District Forester Charles H. Flory. Reference is made to the stands of timber accessible to tidewater, to available water power and the mild winter climate which make southeastern Alaska favorable for large scale newsprint operations.

Tucson Gets Experiment Station

The Southwestern Forest and Range Experiment Station headquarters is to be established at Tucson in cooperation with the University of Arizona, it has been announced.

At present there are four separate research units of the Forest Service in the Southwestern National Forest Region, the Jornada Range Reserve near Las Cruces, New Mexico; the Santa Rita Range Preserve near Tucson; and the Fort Valley Experiment Station, near Flagstaff, where two units conducting silvicultural and range investigations are centered.

The purpose of the consolidation is to promote better coordination and increase the efficiency of these units, as provided for in the McSweeney-McNary Research Act. The consolidation will also enable these units to cooperate with the University of Arizona and will bring these agencies which are conducting research projects along similar lines into closer contact.

New National Park Created

When President Hoover signed his name to the act of Congress establishing the Carlsbad Caverns National Park in New Mexico, he added the twenty-second member to the National Parks system. The area previously was known as the Carlsbad Cave National Monument.

In addition to giving the caverns park status, authority is contained in the act for the President to add to the park by proclamation, upon the recommendation of the Secretary of the Interior, surrounding lands up

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to a total of 193 square miles additional. The surface boundaries of the National Monument took in 719 acres, although the cave extended for miles underground. An investigation will be made by department experts to determine just how much of the authorized lands should be added to provide adequate surface protection to the caves and also to permit of broader surface developments for the benefit of the many thousands of annual visitors.

Forest Memorial to Roosevelt

A memorial archway commemorating the leadership of Theodore Roosevelt in preserving the forest resources of the United States will be erected on the Continental Divide at the summit of the Rocky Mountains on the boundary between the Lewis and Clark National Forest and the Flathead National Forest in Montana. The bill (H. R. 9412) authorizing this memorial was signed by President Hoover on June 2, and was introduced by Representative Scott Leavitt of Montana on February 1. The bill carries an authorization of $25,000 and includes the provision that the plan and design for the archway shall be subject to the approval of the National Commission of Fine Arts.

Bryant With National Park Service

The appointment of Dr. Harold C. Bryant, of Berkeley, California, as head of the new branch of education and research in the National Park Service has just been announced. His official title will be assistant to the director, and headquarters will be in Washington, D. C.

Although his appointment will be effective July 1, Dr. Bryant will not come to Washington until the fall, spending the intervening time studying various natural history problems in the field.

Dr. Bryant has been connected with educational work in the National Parks since its beginning ten years ago, when as an experiment he helped to establish the nature guide service in Yosemite National Park.

He is particularly well fitted for his new duties as head of the National Park educational work. For a number of years he has been identified with the California Museum of Vertebrate Zoology, holding the title of Economic Ornithologist. As a pioneer member of the University of California extension staff he has helped to popularize natural history and has emphasized field studies. In 1914 he took charge of the educational and research work of the California Fish and Game Commission, which grew to such proportions that in 1927 he resigned from his position at the University of California to devote more time to organizing this state work. The direction of the research staff engaged in solving the many serious problems concerning fish and game conservation has consumed much of his time.

Dr. Bryant is a graduate of Pomona College. His graduate work was done at the University of California.

Manitoba's New Forest Law

"The Forest Act" approved by the Legislative Assembly of Manitoba, subject to Imperial assent regulatiing Crown timber and forest reserves in the Dominion of Canada was recently passed by the Government, according to the Lumber Division of the Department of Commerce.

Under this act which is to be in force July 15, 1930, a forestry branch of the Department of Mines and Natural Resources is created under the supervision of a Minister. The duties of this branch are to administer all matters relating to forestry and Crown timber, including the revenue to be derived therefrom; conservation of forests; reforestation; prevention of forest fires; sales of Crown timber and the cutting and inspection of trees and products of the forest. Forest districts may be constituted and a Provincial Forester appointed.

Timber and pulpwood concessions are to be disposed of by auction and licenses issued on these concessions are to be valid for a year, although they may be renewed for fifteen years. Applicants for "pulpwood licenses" must have mills in operation in the Province or furnish bonds of $50,000 for their erection. Pulpwood licenses are bound to manufacture, in Manitoba, merchantable timber out of the pulpwood cut.

Forest reserves as established under the Act are continued, and no lands within such areas are to be disposed of, but are to be under the management of the Provincial Forester, subject to the direction of the Minister.

"The Fires Prevention Act" is amended to provide for the transfer of the duties of prevention and suppression of forest fires from the Minister of Public Works to the Provincial Forester appointed under "The Forest Act."

Yakima Indian Forest Recommended

The House Committee on Indian Affairs reported favorably on May 21 on a bill introduced by Representative Leavitt of Montana to establish a Yakima Indian Forest on the Yakima Indian Reservation in the State of Washington. The proposed forest would cover an area of more than one million acres, of which approximately 586,000 acres are covered with a stand of about 1,780,000,000 board feet of timber. Commissioner C. J. Rhoads reporting to Secretary Wilbur stated: "It is now apparent that such lands will contribute most to the welfare of the nation through maintenance as forest land. They will also produce a continuing revenue to their owners through careful management as timber growing properties."

The bill, H. R. 8529, as introduced by Representative Leavitt, has the endorsement of the Yakima Tribe. It is similar to other bills introduced by Mr. Leavitt to provide Indian forests on the Colville, Klamath and Warm Springs Indian Reservations. Other bills of the same nature have been introduced by Senator Frazier in the Senate.

To Study Northern Elk Herd

William Rush, of the United States Forest Service, has been named to make a comprehensive study of the seasonal range, feed habits and wintering conditions of 17,000 elk

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in the Yellowstone National Park and in the Absaroka and Gallatin National Forests, popularly known as the northern elk herd.

This herd migrates northward in winter to the valleys of the Yellowstone and Gallatin Rivers, and is distinguished from the larger herd which migrates southward to winter in Jackson Hole, in Wyoming. During severe winters the condition of this northern herd becomes critical and heavy losses from starvation occur. The elk drift down into the valleys where they often break through fences in search of food, doing much damage to stockmen and ranchers. On account of the large number of elk involved and the difficulties to be solved in bringing about proper management of this herd, it is essential to have accurate scientific knowledge as a basis of determining the measures warranted for its maintenance and health and to meet the requirements for winter range and feeding.

Log Rules Criticized

The most common log scales used in the lumbering industry are inaccurate and unfair to the seller and buyer, according to Allan W. Corwin, scaler of weights and measures in Allegany County, New York, who addressed the National Conference on Weights and Measures in Washington, D. C., on June 6. Mr. Corwin stated that the widely different readings are not surprising when it is considered that there are at least 57 varieties of log rules in this country, each showing a different result. The discrepancies are particularly important at present because logs are much smaller than formerly and because of the necessity of securing a maximum yield, while with large logs the generally employed inaccurate rules might have been tolerable.

Mr. Corwin described tests conducted in New York and endorsed the International log rule as one which should be made legally standard.

Everglades Park Favored

Secretary of the Interior Wilbur has announced that the departmental committee of experts designated by him to make an examination of the availability of the Everglades in the Cape Sable region of Florida for a subtropical National Park has completed its investigation, and reports that the project measures up to the high standards prescribed for National Park establishment. He stated that the prospective educational value of the area equals at least, if it may not exceed, that of any existing National Park, and that the area should be preserved to protect the primitive character of the country and its abounding wild life so that it may be enjoyed in its natural state by future generations as well as those of our time. For these reasons, he said, he would himself recommend it to Congress for approval as a project.

First Purchases of Refuge Areas

The purchase of a 32,555-acre tract in South Carolina and of 5,180 acres in Colorado as migratory-bird refuges has been approved by the Migratory Bird Conservation Commission, acting on the recommendation of the United States Biological Survey. These areas will constitute the first bird refuges to be acquired by purchase under the Migratory-Bird Conservation Act of February 18, 1929, by which Congress authorized the expenditure over a ten-year period of nearly $8,000,000 for surveys and acquisition of lands for migratory-bird refuges. The actual acquisition of the two areas will proceed immediately after July 1, 1930, when funds appropriated under the act become available to the department. The average price for these lands authorized by the Commission is $1.13 an acre.

The unit to be acquired in South Carolina is in the Cape Romain region, Charleston County, on the Atlantic Seaboard; the other is in the San Luis Lake region, Alamosa County, Colorado.

Petrified Forest Land Exchange

Another step forward in the program of the United States Government to eliminate private holdings from the National Parks and Monuments was taken when the President signed the act of Congress authorizing the exchange of privately-owned lands in the Petrified Forest National Monument for Government owned lands outside the reservation in Navajo and Apache Counties, Arizona.

The Petrified Forest National Monument contains a total acreage of 25,908.4 acres. Of this 12,792.74 acres are in private ownership, representing original railroad land grants and occupying alternate sections throughout the Monument. Such a situation precluded effective administration and also made impossible the construction of an adequate road and trail and system to make available to the visiting public the principal features of the Monument, since the roads and trails would unavoidably have to pass fifty per cent over private lands and expenditure of Government funds could not be authorized under these conditions. It is to obviate these difficulties that the exchange of lands as outlined above was authorized.

The New Mexico and Arizona Land Company, present owner of the alternate sections, has signified its willingness to make the desired exchange, which is solely in the interest of Government administration of the monument.

Georgia Forestry Association

The annual meeting of the Georgia Forestry Association was held in connection with the Georgia Commercial Forestry Conference at Savannah, May 26, 27 and 28, the proceedings of the Association being confined to the reports of committees, resolutions and election of officers.

Excellent progress was reported for the past year. Resolutions approved tax revision

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favorable to forestry; reiterated the action of the association favoring federal purchase of a suitable unit of timbered land in southern Georgia for research work on naval stores production and other uses of southern pines; educational work was endorsed.

The officers elected for the coming year were: T. Guy Woolford, Atlanta, president; Mrs. M. E. Judd, Dalton, 1st vice-president; Senator S. W. Morgan, Guyton, 2nd vice-president; Dr. W. M. Folks, Waycross, 3rd vice-president; Bonnell H. Stone, Blairsville, secretary; J. A. McCord, Atlanta, treasurer.

Remount Depot Established

Negotiations have just been completed for the lease of ground near Missoula, Montana, to be used as a remount depot and training station for pack and saddle stock, both for replacement and for augmenting the number of animals the Forest Service will have available for fires and other emergencies throughout the northern region.

A reserve of from 100 to 150 pack mules and saddle horses will be maintained at this station at all times, subject to demand from any of the National Forests where they are needed. When the number is reduced below 100 through a drain from any cause, immediate steps will be taken to build up again by hire or purchase. Breaking and training of this stock will be going on constantly, as will also the training of men as packers for the type of packing the Forest Service has to do.

Sunset Crater Made National Monument

Sunset Crater, in Arizona, said to be one of the finest examples of volcanic formation in the country, has been established as a National Monument by proclamation of the President.

The new Sunset Crater National Monument is located within the Coconino National Forest and will be administered by the Forest Service. The area set aside for the monument totals 3,040 acres, and includes Sunset Mountain with its extinct crater and the ice caves at the foot. These have been points of interest visited by many people each season for the last twenty years.

President Signs Appropriation Bill

The Agricultural Appropriation bill, carrying $15,859,230 for the Forest Service, was signed by President Hoover on May 27. This provides money for the fiscal year beginning July 1, 1930, and exceeds the appropriation for the current fiscal year by $2,834,950.

Outstanding among the increases were those pertaining to the protection of forests from fire. Of the entire increase, a total of $2,369,500 relates to forest protection. The largest single increase was for protection improvements on National Forests. This was brought from $360,000 to $2,191,000—a total of $1,831,000. Without doubt the recent disastrous fire season on the National Forests, coupled with the testimony gathered to support the Englebright bill lent impetus to the recognition of this need. Cooperative funds for protection of private and state owned forest lands, provided under the Clarke-McNary law of 1924, were increased by $300,000 to a total of $1,700,000 and the item for preventing and suppressing fire on National Forests received an additional $188,500, giving a total of $2,230,000. The wording of this section of the appropriation bill has been broadened to give greater flexibility in its administration by expanding the purposes of these funds to permit their use for fire prevention as well as fire suppression. Previously the appropriations have been for fire suppression. This addition was urged by The American Forestry Association during the public hearings before the House Committee on Agricultural Appropriations last December. The new words will permit the use of portions of the allotment for the employment of fire guards, for educational work and for other activities intended to prevent fire.

Forest research as outlined by the McNary-McSweeney law receives increases totaling $248,500 to the Forest Service and $31,043 to the Department of Agriculture bureaus conducting investigation in forest diseases, insects, wild life and fire weather. The total appropriation for all the items in the research program authorized by the McNary-McSweeney law now total $1,758,820—while the authorization as stated within the law is $2,500,000.

Included within the appropriation bill is $100,000 for the construction of new buildings for the Forest Products Laboratory at Madison, Wisconsin, together with permission to the Secretary to obligate additional expenditures to the amount of $800,000.

No increase was given for the purchase of forest lands in the eastern states. The appropriation is $2,000,000 for the present year, although the Woodruff-McNary law carries an authorization of $3,000,000 for this purpose. The approval by President Hoover on May 27 of the new Clarke-McNary law assures the continuation of appropriations for land purchases during the two years following June 30, 1932. This new law authorizes $3,000,000 a year for two years,

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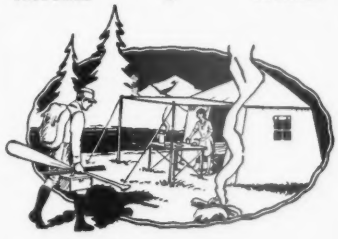

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and efforts are underway to assure appropriations equal to the authorizations.

The Knutson-Vandenberg forest planting bill was signed by President Hoover on June 9. It applies only to National Forests east of the one hundred and second meridian. Authorizations are given for $250,000 for the year beginning July 1, 1931, $300,000 for the year beginning July 1, 1932, and $400,000 for each year thereafter. An amendment introduced by Representative Cramton, of Michigan, permits the Forest Service to grow and furnish trees to the National Park Service with which to plant burned areas on the National Parks. Inasmuch as the new law applies only to eastern forests, the park amendment may be difficult to administer.

The Clarke-McNary law authorizing appropriations of $3,000,000 a year for the two years beginning July 1, 1931, passed both houses of Congress and was signed by the President on June 9. This carries forward the existing authorizations of the Woodruff-McNary law, and serves as a temporary substitute for authorizing legislation with which to realize the ten-millon acre purchase program authorized by the National Forest Reservation Commission last July.

Two bills for which The American Forestry Association has been working will fail to pass during the present session of Congress unless special efforts now being exerted are effective. One of these is the Engelbright bill (H. R. 3245) which would authorize appropriations for improvements on National Forests more to effectively combat forest fires, and the other is the Shipstead-Nolan bill (S. 2498 and H. R. 6981) for developing a coordinated program of forest management and recreation on the Superior National Forest, in northern Minnesota.

Hearings on the Englebright bill were completed last March but the Agricultural Committee withheld its report to Congress. This makes impossible a place on the calendar. In the meantime the Senate counterpart (S. 3594), introduced by Senator McNary, was reported favorably to the Senate and passed that body on May 27. This bill now rests on the Speaker's desk, but without a favorable report from the House Committee on Agriculture further action is impossible.

The Shipstead bill (S. 2498) referring to the Superior National Forest passed the Senate on May 7 and was referred to the House. In the meantime the Nolan bill (H. R. 6981) has been favorably reported by the House Committee on Public Lands, but has never been given a place on the calendar. It appeared several times on the Consent Calendar but each time was passed over. On June 9 it was stricken from the Consent Calendar upon action by Representatives Pittenger of Minnesota, Stafford and Schneider of Wisconsin, and Miller of Washington. The only way to restore it is by a suspension of the rules or by a special rule. Either case depends upon action by the rules committee of which Representative Snell, New York, is chairman.

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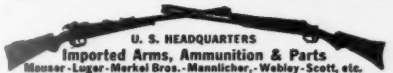

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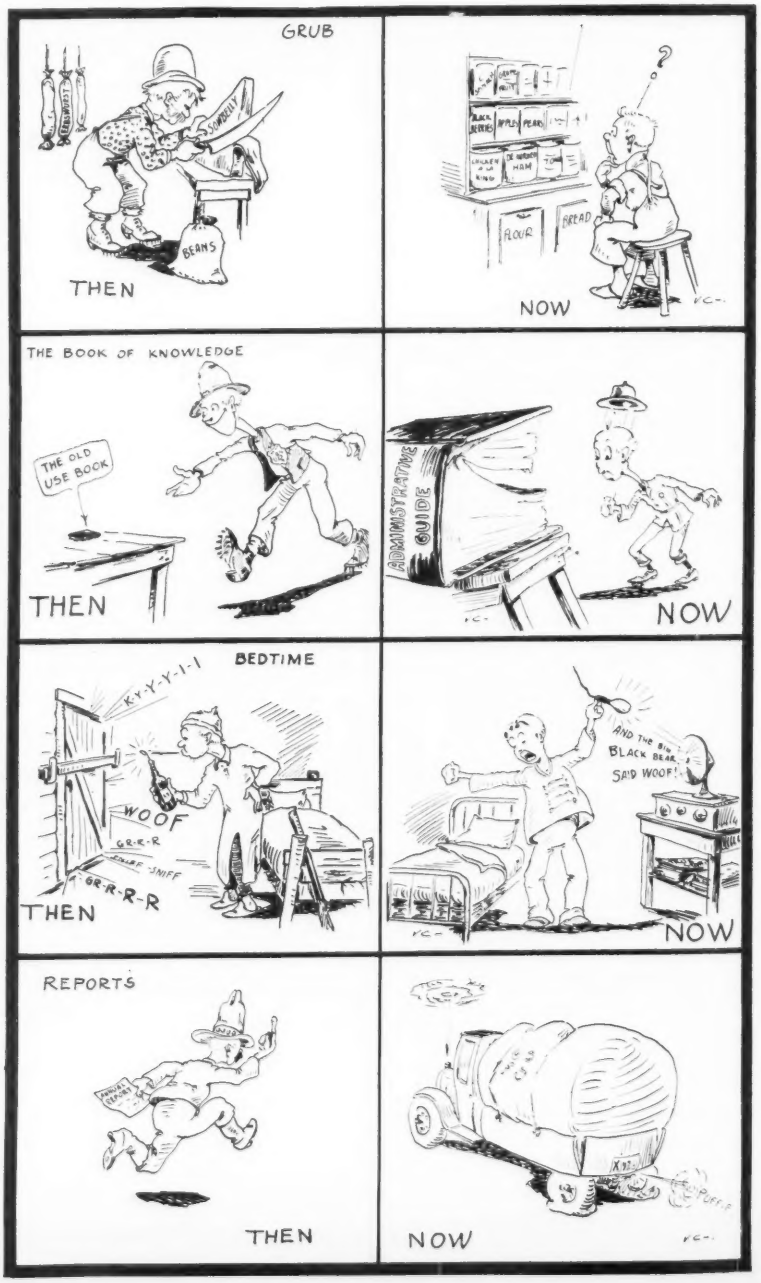

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The National Forests Today

(*Continued from page* 407)

forest-land administration. The National Forests make up a great system of public properties, in process of development. From reserves of wilderness lands the western areas have been converted into managed enterprises constituting a tremendous national asset. The eastern National Forests are not yet so far along, having been under administration a shorter time and having been at the outset in worse condition; but they too are being built up in value and are steadily increasing in present as well as potential usefulness.

What have the National Forests cost to date? The difference between the total outlay for administering, protecting, developing, and improving the forests and the cash receipts from them has been equivalent to an average net outlay of only a very few dollars per acre on the 160,000,000 acres of land now owned. For the 3,000,000 acres of eastern forests acquired by purchase an average price of $4.70 an acre has been paid. The other 157,000,000 acres, as part of the Public Domain, of course cost the people of the United States something originally to obtain; but its prospects as a revenue earner for the Treasury had it remained open for disposal would not seem to justify putting much of a value on it as a government asset when it was given forest reserve status. On the basis of cost, therefore, the National Forests represent at the present time an investment of very moderate per-acre book value.

But the forests are no longer, as they were when their administration began, undeveloped wild land. They are equipped—though still far from sufficiently—with a system of improvements to facilitate their administration and use—37,601 miles of telephone lines, for example; 8,921 buildings of various kinds, in addition to 913 lookout towers or houses; 10,728 miles of boundary and drift fence to control the movements of livestock; 2,286 developments of watering facilities for livestock using the range. Roads and trails have been built that have cost more than $100,000,000 all told.

Yet this is a relatively unimportant part of what the government has to show for twenty-five years of administration by the Forest Service, in addition to the land itself. The National Forests are a going enterprise, manned by a personnel of capable trained executives and technical experts, organized for efficient performance, guided by experience and functioning systematically. It is this structural organization and development, out of nothing, of the complex technic of resource management and of right relationships between the resources themselves and those who use them that is the greatest result of the expenditures annually made for the care of forests and conduct of business connected with forest use. (*Continuing on page* 478)

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Sealed bids will be received by the Regional Forester, Forest Service, Milwaukee, Wis., up to 2 P. M., September 2, 1930, and opened immediately thereafter, for all the merchantable dead timber and the marked or designated live timber on two adjacent units, totalling about 34,000 acres in T. 146 N., 147 N., and 148 N., R. 26 W.; T. 147 N. and 148 N., R. 27 W.; T. 147 N. and 148 N., R. 28 W.; and T. 147 N., R. 29 W., 5th P. M., Chippewa National Forest, Minnesota. The estimated amounts to be cut are: On Block I, east of Pigeon River, 11,860,000 feet b. m. of sawlogs (including 9,930,000 feet of aspen), 5,920 cedar and tamarack ties, 1,100 cedar poles, 90 cords of spruce pulpwood, 860 cords of balsam pulpwood, and 100 cords of jack pine pulpwood, and, to be taken at the option of the purchaser unless otherwise bid for, 360,000 feet b. m. of elm, maple and ash sawlogs, 4,200 cedar posts, 1,650 cords of aspen pulpwood, and an unestimated amount of balm of Gilead; on Block II, between Third River and Pigeon River, 46,250,000 feet b. m. of sawlogs (including 40,180,000 feet of aspen), 16,560 cedar and tamarack ties, 4,280 cedar poles, 5,840 cords of spruce pulpwood, 3,700 cords of balsam pulpwood and 110 cords of jack pine pulpwood, and, to be taken at the option of the purchaser unless otherwise bid for, 1,620,000 feet b. m. of elm, maple and ash sawlogs, 28,100 cedar posts, 4,800 cords of aspen pulpwood, and an unestimated amount of balm of Gilead. Agreement, as part of any bid, to take all, or specified species, or specified quantities of specified species of the optional materials, or to utilize certain hardwood species to less than 9 inches in the tops, may be considered in making awards.

The lowest bid prices which will be considered for the timber on either or both blocks are: for sawlogs, Norway pine, white pine and oak, $5.00 per M feet, log scale; jack pine and spruce, $3.75 per M feet, log scale; ash, $3.00 per M feet, log scale; balsam, white and yellow birch and basswood, $2.75 per M feet, log scale; aspen, maple, elm and balm of Gilead, $1.00 per M feet, log scale; for pulpwood of spruce and balsam, $1.40 per cord, and for other species 50c per cord; for ties, 10c each; for poles, 1½c per linear foot; for posts, 1c each. A cooperative deposit of 25c per M feet for all sawtimber, in addition to the prices bid for the stumpage, will be required.

A deposit of $2,000 must accompany each bid for the timber on Block I, of $3,000 for the timber on Block II, and of $5,000 for the timber on both blocks combined, to be applied on the purchase price, refunded or retained in part as liquidated damages, according to the conditions of sale.

Bids may be submitted for either or both Block I and Block II, but the right is reserved to award on any basis that may appear most advantageous to the United States, or to reject any bid for either block, or to reject all bids.

Before bids are submitted, full information concerning the timber, the requirements concerning rates of cutting, the deposit with bid, the financial showing required of bidders, and other conditions of sale should be obtained from the Regional Forester, Milwaukee, Wis., or the Forest Supervisor, Cass Lake, Minnesota.

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The National Forests

(*Continued from page* 476)

National Forest development is still incomplete. Much more will need to be spent before they will be properly made ready for maximum public service. Much will need to be spent for tools and machinery of various kinds; much for research; much for reforestation and other measures to increase and improve the growth of timber, the yields of forage and water, the value of the forests for public recreation. The need for many of these things is crying. Not to provide them as rapidly as possible is poor economy. But whether or not the annual expenditures are raised to provide for them, it will remain true that a large part of each year's outlay in a very real sense is invested in developing a great national enterprise, of wide beneficence, of brightest promise, and of tremendous value as a working out of the possibilities of public forest ownership in connection with the whole national problem of land use.

Uncle Sam—Greatest Forester

(*Continued from page* 437)

vals through the forest from section lines or established control lines. The diameter and merchantable height of the individual trees on these strips are measured and recorded and the results applied to volume tables. This gives an estimate on a certain percentage of the area and it is then a simple matter to obtain the volume for the total area.

A timber sale appraisal is then made which establishes the exterior boundaries of the tract to be logged and estimates the cost of the different operations necessary before the timber can be delivered in the form of logs to the mill. These operations consist of felling the timber, including disposal of slash and diseased trees, cutting the timber into logs and skidding them to some point where they can be transported by stream driving, fluming, auto or horse truck, or railroad. The amount of timber involved and the character of the topography are largely the deciding factors as to the means of transportation which will be used. It is then necessary to determine the milling costs and the average value of the lumber when ready for market. The sum of the logging costs, milling costs, and a reasonable margin allowance for profit and risk deducted from the average selling price of the lumber determines the stumpage value a thousand board feet.

The applicant is then advised of the stumpage found and, if he still desires to purchase, a sample timber sale agreement is prepared, its terms fully discussed with him, and the timber advertised for sale for a period varying from thirty to ninety days. Sealed bids are received for the timber and award is made to the highest bidder. The successful bidder is required to furnish satisfactory bond and sign the agreement. When the purchaser begins the construction of his improvements a forest officer is assigned to take charge of the sale. He works with the purchaser in the location of the logging improvements, and approves the general scheme of logging, the fire protection plan and the sequence of cutting. In advance of actual cutting operations he must see that sufficient timber is marked to avoid any possibility of delay in the operation.

The man in charge of the sale is responsible for all activities on the sale area and for the work of the men assigned to help him with the marking and scaling. He is responsible for seeing that all the conditions of the agreement are complied with—that the trees are felled so as not to injure the reserved timber, that no unmarked timber is cut, that no unnecessary damage is done by the logging method used, that the slash and defective trees are disposed of properly, that no timber is removed from the sale area prior to scaling, that the timber is utilized properly, with particular reference to cutting low stumps and complete utilization in the tops, that fire-fighting equipment is ready for instant use and that everyone use the greatest care to keep fire out of the woods.

The estimated stand of timber on the National Forests today is 552 billion board feet, representing about one-fourth of the standing timber in the United States. The annual receipts from sales of National Forest timber have grown from $85,000, in 1905, to $4,109,000 in 1929. The timber cut for 1929 was 1,502,000,000 board feet. It is estimated that the National Forests can be made to produce a permanently sustained cut of from five to six times as large as is now being removed from them. This will mean an annual production of about 8,000,000,000 board feet. The Forest Service as custodian of Uncle Sam's big forest now employs a personnel of 2,700 and of this number about 650 are technically trained.

And so with the coming of increased appropriations for timber inventories and salaries of technical assistants it has been possible to make intelligent progress towards putting the timber lands of the National Forests on a sustained yield basis. Sustained yield means nothing more than that the forest will not be cut any faster than it grows and that there be markets available to utilize this yield. In other words, sustained yield means permanency. There develops around any manufacturing industry a dependent community. If this industry has the earmarks of permanency, there is an incentive on the part of the individuals of the community to establish permanent homes. Permanent homes demand churches, schools, amusements, stores, garages and all those things which are essential to the happiness of our present-day American family. Sustained yield is therefore far-reaching and has much more behind it than the mere marketing of the products of the forest.

The Great Fire

(*Continued from page* 428)

On they ran, the panting animal pulling first one, then the other. Hundreds of spark-set fires sprang up beside the trail; these grew into crown fires, becoming the forerunner of the great conflagration. By superhuman effort they reached the summit on the Idaho-Montana state line. Here the fire in the sparce timber lost ground. On sped the men down the other side until the fire was left behind. Ten miles farther, completely exhausted, they reached a small cabin, where they unsaddled their jaded, faithful, little horse, threw themselves into a bunk and fell asleep. Two hours later the whinnie of the horse awoke them. A glare lighted the cabin. They rushed out; the fire was again all around them! They rescued the little horse from the already burning barn and dashed down the gulch. It was a desperate race for life. Trees falling above, shot down the steep slopes and cut off their trail. The now saddleless, frightened little beast, driven by the men, jumped over and crawled beneath these logs like a dog. Two miles of this brought them to some old placer workings and safety. Exhausted, they fell. The fire swept on.

They had crossed a mountain range and covered a distance of nearly forty miles in a little over six hours, including their stay at the cabin—almost a superhuman feat.

Returning to Wallace I learned that the outside world had suffered far more than we. Eighty-nine men had given up their lives in the great holocaust. The hospitals were overflowing with sick and injured. Hundreds had become homeless refugees.

Assigned the task of photographing the scene of the many casualties, I had an opportunity to observe the extent of the appalling disaster and to reconstruct the scene of the last, hopeless stand taken by those heroic, unselfish men who gave their lives that others might live. Still, not all those heroic efforts were hopeless or vain. Ranger Pulaski, who so valiantly saved all but six of a large crew, has become a national hero, an outstanding figure in the annals of forest history.

Forest Supervisor Weigle, who for weeks had so tirelessly worked day and night, unselfishly and alone plunged through the very face of the tempest of fire in an attempt to warn the citizens of Wallace of their danger. At last hopelessly trapped, he rushed through a burning mining mill into a tunnel. As the building fell the tunnel caved, threatening to bury him alive. Covering his head with his coat he crawled out, plunging through the burning wreckage into a tiny creek. In a few hours he had worked his way through the fire to Wallace, there directing and assisting with the dead and injured.

Ranger Danielson, who so courageously led his little crew into an open mining cut on a mountainside, will bear the horrible, purple scars on neck and hands to his grave, as will all those who were with him. Rangers Phillips, Watson, Vandyke, Rock, Bell, and many others saved the lives of hundreds by their cool, timely judgment. Scores of other unsung heroes still live and work among us, their fortitude a bright and lasting example.

On Big Creek, thirty men lost their lives while others lay prone for hours in the chilling waters of a tiny stream, great forest giants falling around and across them. Here three men were crushed by a falling tree. One of these unfortunates was caught only by the foot. Men a few feet away heard his cries and prayers. but were powerless to assist. He dug and fought to tear away, but the thing which he had come to save held him fast until coma and finally death relieved

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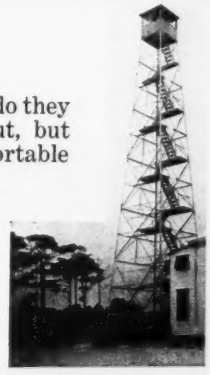

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his sufferings. On Setzer Creek the ghastly, human toll was twenty-nine. An entire crew was annihilated. The men fell as they ran before the merciless fire.

Each scene is a gripping story of almost unparalleled heroism and sacrifice which it would take pages to recount. Our experience as compared with these was tame indeed, insignificant, a mere detail.

Two decades have passed through the hourglass of time and nature has again reclothed the naked landscape with grass, shrubs and trees, but the great sacrifice of human life is not, and can never be, replaced or forgotten.

"June Eleventh"

(*Continued from page* 461)

The woman from the city whose son applied for the few acres of a key site back in the mountains declared: "This soil is ideal for the rearing of rare tulip bulbs, which I can pack out thirty-five miles and sell for fifty cents apiece. They can be raised better here than anywhere else. No; neither I nor my son has had any practical experience in agriculture." And always some applicants believed that by a combination of plausibility, abuse and political pressure, they could discredit the field examiner, fool their Congressman, and make the Washington office believe that what the examiners reported as black was in fact actually white. There are in the files of the Forest Service numerous cases, such as the famous "House case" of Oregon, showing the persistency of plausible attempts by claimants to deceive. In many instances the costs of inspection and repeated reexaminations exceeded the value of the land.

But time is a great vindicator of justice and truth. One day some years ago a man walked into the District office at Portland, Oregon, and said:

"Six years ago I applied under the forest homestead law for 160 acres of land in the Deschutes National Forest. You rejected my application, saying that the land was not suitable for farming. I appealed to my Congressman and finally beat you and made filing and settlement. I have come in here today hunting you up to tell you that I spent six years of my life and six thousand dollars in cash in finding out that you were right. The next time you tell me a piece of land is not chiefly valuable for agriculture I am going to take your word for it."

And what has been the result of all this activity? To give it in detail would make a long, long story. Up to the close of the year 1929 the Forest Service had received a total of 49,061 individual applications for forest homesteads. After careful examination of each tract on the ground, 19,793 individual tracts, involving a total area of 2,187,429 acres, were found to be chiefly valuable for agriculture and were opened for entry under the Act of June 11, 1906. Experience has demonstrated that even a large part of this land was not in fact "chiefly valuable for agriculture." Thousands of these tracts were promptly sold or abandoned as soon as the applicant secured title, and in not a few cases the present owners are disposing of them to the Government in exchange for merchantable saw timber.

Who was at fault? No one. It was waste effort chargeable to the fallibility of human nature. "June eleventh" work was an infantile disease attacking young National Forests like measles, whooping cough or croup among children. Apparently unavoidable, none of the patients died from it, but nearly every National Forest today suffers more or less from its scars.

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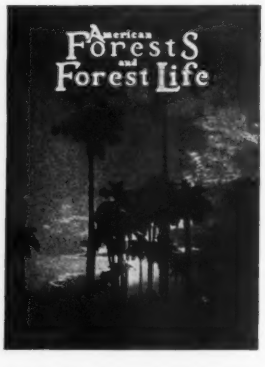

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July, 1930

The Ranger's Boss

(*Continued from page* 460)

summer, and read Prescott's *Conquest of Mexico* to them, evenings. You see, with the infiltration of college-trained men into the forest work, and the marrying of those men to young school teachers or music teachers or trained nurses or just college girls who had no special bent, we developed a unique social life. There were, besides, three outside groups to draw upon—the sawmill people, the power companies' men and the teachers and preachers of the Indian Mission. The first group were essentially hard workers and shrewd business men, and the wife of one of them kept an inn that seemed like home to all the Service. The power companies sent trained civil and electrical engineers into those hills. And as for the Mission, to choose one sample, Alexander Hood would have been a success in any church. Teachers, too, both in the country schools and the Mission, naturally foregathered with the people of the Forest Service. So, though at first the rough miles between us—and the high cost of horse-feed—rather restricted social intercourse, what we did have was—don't laugh—select. And with the building of roads and telephone lines, the good times came more often.

There was also the entertaining, as best we could, of timbermen, stockmen, tourists and our own higher-ups who, because of our distance from towns, were often our guests for a meal or two or overnight. Our own men brought the greatest pleasure always—or almost always. Occasionally an inspector thought his whole duty consisted in finding fault. Him we endured, trying our best to do things his way thereafter. But people who understood helped us immensely and taught us a lot. Those we dined in turn, surreptitiously borrowing each other's silver and linen. And because of their rare visits we were inspired to think straighter and work harder. Then there were the younger men who grew into big ones—and others who didn't grow but were interesting for a time, till one saw that the Service to them was just a meal ticket. All in all, the human-interest side of those early days was large.

Perhaps the times of keenest interest to the women of the Service were the summers, from mid-July to early October—the dreaded fire seasons. Then indeed we knew we were of use. Men had to hurry to the scene of action. It sometimes devolved upon us to load the kyaks for the pack horses who followed and to do up rolls of bedding, to saddle our own horses and ride for additional helpers. If a fire were alarmingly close, we even fought fire. Most often we cooked and cooked. If the fire were at all near, we made up beds for relays of exhausted men, and we made gallons on gallons of coffee to be carried in canteens along the fire lines. And afterwards we helped our tired bosses to make out their fire reports, to estimate the loss in timber and forage, to reason out causes and to plan better ways to fight fire next time.

Not all of us—oh no! There were some slackers even among the women. The worst of that was that they couldn't be fired as inefficient men could. There was the woman who couldn't—or wouldn't—sleep while her husband was twenty or fifty miles away fighting fire all night, but was a nervous wreck when he got home. There was the Southern woman who complained of the lack of servants and of this and that convenience till one of our finest girls retorted with: "What of it? Those are not the essentials. I don't have them either, nor does the supervisor's wife." To which the Georgia woman came back with: "No; but then I ain't been raised rough like you and Mrs. Shinn." Perhaps that choice bit didn't become a by-word in our forest! And there were the wives who kept their husbands unhappy because they were sure their bosses were not having the praise or the promotion they deserved. But these were the exceptions. As a group, the early forest women were a mighty fine lot, and did their large share to start the system that has developed into the great Forest Service of today.

Some of the same problems face the present ranger's wife, but roads, telephones, automobiles, larger congressional appropriations, radios, the growing popularity of the Service and, more than all, the highly developed organization have taken the weight of the burden off her shoulders. Perhaps some of them can now even claim the title, "the ranger's boss." But except in the most accessible parts of the least improved forests, she cannot quite be the friend and fellow-worker of the men of the Service that the women were a quarter of a century ago.

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The Smith INDIAN Fire Pump

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The Search for Forest Facts

(*Continued from page 423*)

logger. The practical limitations as envisaged by the supervisor, and the silvicultural considerations, as understood by the experiment station men have had to be blended together before the "marking rules" could stand the test of good forestry and common-sense logging operations. The same is true of our methods of slash disposal.

Grazing investigations of the range experiment stations are similarly responsible in large measure for the scientific foundation underlying the regulation of grazing.

It was in the field of forest planting, however, that the stations' contributions to the management of National Forests has been particularly conspicuous. The success of many large-scale reforestation projects is due to their tedious preliminary experiments and research. It is doubtful if the Nebraska National Forest, in Nebraska, the pride of the Service, would ever have succeeded were it not for the work of Carlos G. Bates, who through painstaking experimental plantings had developed the necessary technique and the proper source of seed, factors so essential in the establishment of new forests under adverse conditions. Our forest nursery methods, as used not only on the National Forests but also the country over, our methods of seed collection, seed extraction, and seed storage, all had their origin in the work of the forest experiment stations.

Working plans, now an essential feature of every National Forest, could not have come into existence except for the work of the experiment stations in securing the indispensable volume, growth, and yield data.

Twenty-five years ago there was no science of forestry in this country. We knew next to nothing about our forest flora, our forest types, the factors responsible for the distribution and growth of our forest trees, their life histories, their enemies, their diseases. Today, while we are still far from having attained perfection, we have a fair knowledge of the life of the trees which we grow. We may not yet be in a position in every case to get the results when and wherever we want them, but we know enough to avoid the most glaring mistakes.

The moot question of the relation of forests to climate and streamflow, upon which our entire National Forest policy rests, has received a great deal of careful study by some of the experiment stations. Their contributions to the sciences of forest meteorology and forest hydrology are recognized throughout the world. Investigations, conducted in cooperation with the Weather Bureau, on two watersheds at the Wagon Wheel Gap Station, in Colorado, although poorly chosen, stand out as classical examples of the scientific approach to and the best technique in the study of such involved problems.

These are merely a few of the problems bearing directly upon National Forest management which the stations have helped to solve.

The greatest contribution of all, however, although less tangible, is the spirit which they have inculcated into the handling of the natural resources. Under the pressure of administrative problems, the technical ideal of the forester has naturally at times become dim. It is the forest experiment stations which, like the Vestals of old, have kept the sacred flame burning and have created an atmosphere hospitable to the application of technical ideas. They have helped to raise the level of the forester's job from the lowly ranks of cowpunchers and lumberjacks to one of the leading scientific professions in the country.

The research man must anticipate coming needs and, of necessity, be ahead of his time. To be ahead of his time means standing alone, exposed to the skepticism and even ridicule of those who live from day to day. Conditions, however, are rapidly changing. Forest practice throughout the country is becoming more intensive and administrators are now eager to turn the results of scientific effort to practical use. As research takes its rightful place in the vanguard of the forest movement, the names of the early "searchers for forest facts" will be enshrined together with the names of other pioneers who have helped to build up the Forest Service.

Public Domain Committee Meets

Reports from the various government offices having to do with the administration and disposition of the Public Domain were presented June 7 to President Hoover's Committee on the Conservation and Administration of the Public Domain. The meeting was attended by Secretary Ray Lyman Wilbur of the Department of Interior and Secretary Arthur M. Hyde of the Department of Agriculture.

Due to the mass of material presented, the Committee suspended hearings in order to give the members opportunity of making a thorough and careful study. Reports submitted by the General Land Office, Bureau of Reclamation, Geological Survey, National Park Service, Forest Service, Indian Service, and the Interior Department Oil Committee point out how diverse and intricate are the many problems interwoven with the details of the Public Domain.

During the summer months there will be informal conferences between the individual members of the Committee in order to enable them to become familiar with various problems of the federal and state lands.

Our Eastern Forests

(*Continued from page* 438)

areas are set aside in order to afford examples of primeval life. But beyond these, and with no complaints, the forests in the White Mountains are cut, sold and regrown on a scale that makes the forest more than self-supporting, including all of the costs of maintaining the recreational areas.

Are forests needed along the Appalachian chain? Let every citizen feel that it is his task to spread public opinion and secure the reestablishment of well-stocked forest growth, not only in the eastern Appalachian Mountains, but also throughout all of the great states east of the Mississippi River. Four-fifths of the population of the United States lives east of the Rocky Mountains; four-fifths of the remaining old-growth timber of the country stands west of the Rocky Mountains. We cannot go through another great emergency like the World War without importing timber either from a foreign country or from the far West at a great expense of time and of money.

One hundred and fifty million acres of National Forests in the West, reserved largely by Presidential proclamation, are a splendid tribute to American foresight, but they are insufficient to meet the industrial needs of a great nation. The beginnings of National Forests in the East are likewise a tribute to national intelligence, but action is too slow. It is pusillanimous in proportion to the need. It is our duty and our privilege as American citizens to demand that Congress more speedily provide the East with National Forests adequate to the social and economic needs of its people.

National Forests of the Northland

(*Continued from page* 455)

value lies in the making of paper, especially of the newsprint grade, and the Forest Service intends to handle them primarily to produce this material. The timber is largely western hemlock and Sitka spruce, both excellent paper-making woods. Other local factors are also favorable to paper manufacture, such as good water-power resources for paper-mill operation, and cheap water transportation.

The Alaska forests are estimated to contain about eighty-five billion board feet of timber and it is estimated that the growth of wood under the practice of forestry will be sufficient to permit of cropping yearly for all time an amount that will produce 1,000,000 tons of newsprint paper.

The important consideration is, of course, the assurance of the timber supply of the future. The farmer, with crops that mature annually, can be relied on to plant and cultivate for successive harvests, but pulpwood trees may require seventy-five years or more to reach merchantability and the harvester of one crop is likely to take little interest in the growing of a second on the same land. But on the National Forests the government is committed to the policy of growing successive timber crops, the American people having recognized that assurances of a sustained supply of timber are a matter of national public concern. National Forest lands will always be retained in public ownership and they have been dedicated to the production of timber. In Alaska the measures needed to keep these lands productive have already been formulated. The paper industry will not be allowed to expand beyond the point where its yearly wood requirements would exceed the average annual amount of tree growth in the region, curbs are placed on the amount and kind of the cutting operations, the requirements to insure reforestation of the areas cut over each year have been set up, and the new forests will be protected until each in its turn reaches merchantability.

Every encouragement consistent with the public interest is now being given by the government to the early establishment of this industry in Alaska on account primarily of its important bearing on the local development of the southern coast of the Territory. There is reason to believe that a start will be made in the industry here within two years.

These Alaska forests, free of many of the complications and problems that too frequently discourage or prevent the practice of forestry over extensive areas, offer an excellent opportunity to create a great, permanent, forest industrial center.

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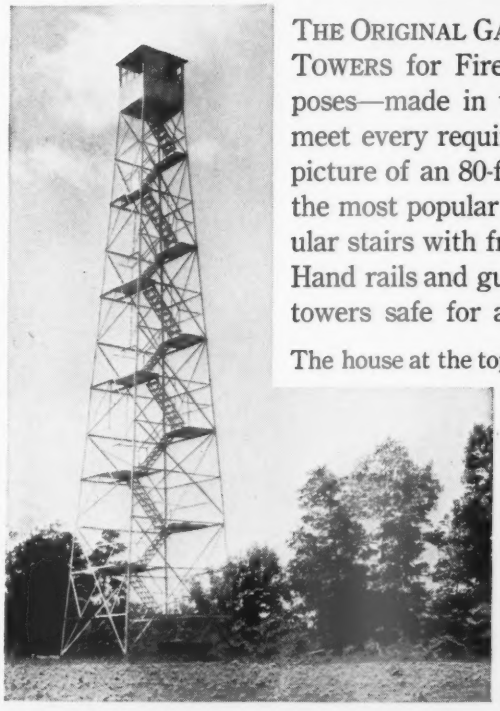

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Conservation Calendar in Congress

LAWS PASSED

S. 3585—Eliminating certain land from the Tusayan National Forest, Arizona, and adding to the Western Navajo Indian Reservation. Approved and signed by President May 23. Public Law No. 250.

H. R. 2152—To promote the agriculture of the United States by expanding in the foreign field the service now rendered by the United States Department of Agriculture in acquiring and diffusing useful information regarding agriculture, and for other purposes. Approved and signed by President June 5.

H. R. 8368—Providing for a study regarding the construction of a highway to connect the northwestern part of the United States with British Columbia, Yukon Territory, and Alaska in cooperation with the Dominion of Canada. Approved and signed by President May 15. Public Law No. 228.

H. R. 9421—To construct a memorial to the leadership of Theodore Roosevelt. Approved and signed by President June 2. Public Law No. 296.

H. R. 10877—Authorizing $3,000,000 for the fiscal years 1932 and 1933 to purchase forest lands in the Eastern States as authorized by the Weeks Law. Approved and signed by President June 2. Public Law No. 298.

S. 3817—Authorizing expenditures for National Forest administration. Approved and signed by President May 27. Public Law No. 268.

S. 195—To facilitate the administration of National Parks. Approved and signed by President May 26. Public Law No. 255.

H. R. 26—Authorizing the acquisition, establishment and development of the George Washington Memorial Parkway in the District of Columbia and in the adjoining states of Maryland and Virginia. Approved and signed by President May 29. Public Law No. 284.

H. R. 7405—Providing a five-year construction and maintenance program for the United States Bureau of Fisheries. Approved and signed by President May 21. Public Law No. 240.

S. 4015—To provide for plant patents. Approved and signed by President May 23. Public Law No. 245.

S. 3531—Authorizing appropriations to enlarge tree planting operations on National Forests. Approved and signed by President June 9.

H. R. 7491—Department of Agriculture bill, carrying appropriations for 1931 for the Forest Service, Biological Survey and conservation activities in other bureaus. Approved and signed by President May 27. Public Law No. 272.

S. 3169—To reorganize the Federal Power Commission. Approved and signed by President June 23.

H. R. 4020—Haugen—Authorizing the Secretary of the Interior to investigate and report on the advisability of establishing an Upper Mississippi National Park in Iowa. Approved and signed by President June 14.

S. 3950—To establish a migratory bird refuge in the Cheyenne Bottoms, Kansas. Approved and signed by the President June 12.

H. R. 6130—To exempt the Custer National Forest from the operation of the forest homestead law. Approved and signed by the President June 13. Public Law No. 353.

FORESTRY

S. 2498—Shipstead—To promote the protection and highest public use of lands and waters in the Superior National Forest in northern Minnesota. Passed Senate May 7. Reported to House without amendment June 17. Report No. 1945. Replaced H. R. 6981, introduced by Representative Nolan of Minnesota.

H. R. 12902—Wood—Second deficiency appropriation bill, including special appropriations for numerous forestry and conservation items. Passed the House June 20.

H. R. 3245—Englebright—Authorizing an appropriation of $4,500,000 for constructing permanent improvements on National Forests to provide more effective fire protection. Held by House Committee on Agriculture and Forestry.

S. 3594—McNary—Similar to above bill. Reported to Senate May 27. Report No. 731. Passed Senate June 2.

S. 4586— McNary—To authorize additional appropriations for the national arboretum. Referred to the Committee on Agriculture and Forestry. Favorably reported. Passed Senate June 27.

PARKS

H. R. 11900—To authorize the Secretary of the Interior to investigate and report to Congress on the desirability of the acquisition of a portion of the Menominee Indian Reservation in Wisconsin for the establishment of a National Park. Passed House June 9.

H. R. 12381—Owens—To provide for the establishment of the Everglades National Park in the State of Florida. Referred to Committee on Public Lands. May 14.

INDIAN AFFAIRS

H. R. 6865, H. R. 6863, H. R. 6864, H. R. 8529—Leavitt—To provide for the establishment of the Colville, Klamath, Warm Springs and Yakima Indian Forests. H. R. 8529—Reported favorably to House May 21. Report No. 574. Passed House June 23.

WILD LIFE

H. J. Res. 243—Authorizing an appropriation to defray one-half of the expenses of a joint investigation by the United States and Canada of the probable effects of proposed developments to generate electric power from the movement of the tides in Passamaquoddy and Cobscook Bays. Referred to the Committee on Foreign Relations. Reported June 2.

S. 2908—Norbeck—Extending protection to American Eagle. Passed Senate April 7. Referred to House Committee on Agriculture and Forestry.

H. R. 5278—Haugen—The so-called "Bag Limit" bill. Hearings of January 27, 28 and 29, 1930, published.

S. 941—Hawes—To regulate interstate shipment of black bass. Passed both houses and referred to conference June 26.

H. R. 10625—Hudson—Regulating oil pollution of all navigable waters so as to protect fish and game. Hearings held May 2, 3 and 26. No further progress.

S. 4373—Ransdell—Similar to above.

MISCELLANEOUS

H. R. 8479—Amending the Mississippi flood control act of May 15, 1928, respecting reimbursement for repairs to levees destroyed on the Mississippi River, its tributaries and its outlets by the 1927 flood. Passed House May 23. Passed Senate, amended, May 29. House agrees to Senate amendments, June 10.

H. J. Res. 307—Authorizing an appropriation for 1931 of not more than $300,000 of $600,000 authorized to be appropriated for 1932 under the migratory bird conservation act of 1929. Passed House June 9.

S. Con. Res. 23—Wagner—To establish an American Conservation Week. Reported favorably by Committee on Public Lands and Surveys and passed by Senate June 6.

H. R. 9376—Sears—For a comprehensive system of flood control throughout the Mississippi Valley and the creation of a Federal Board of Public Works. Hearings held June 6, 7, and 9.

Note: The bills reported here are those which have been introduced or progressed since reported in the June Calendar. For information concerning other bills see Calendar in June issue.

Lake Superior
Lake Michigan
Lake Erie
ONTARIO
"Hiawatha Land"
"The Thumb"
GOV. CASS TREATIES SEND INDIANS WEST 1813-31
8
"WALK-IN-THE-WATER" ARRIVES IN DETROIT 1818
9
SETTLERS FROM EAST; STATEHOOD 1837
10
COPPER & IRON MINES OPENED ABOUT 1845
11
LEADING LUMBER STATE 1870-90
12
THE MOTOR ERA
13
PERRY'S VICTORY ASSURES U.S. CONTROL 1813
7
PONTIAC'S REVOLT 1763-65
6
INTO BRITISH HANDS 1760-61
5
Fur Trade
4
CADILLAC SOUNDS DETROIT, 1701
3
MARQUETTE ARRIVES 1668
2
PETOSEGAY "SUNBEAMS of PROMISE"
1
CALUMET
ONTONAGON
HANCOCK
HOUGHTON
Porcupine Mts
Sawmill
Bear Cub, posing
Gogebic Lake
Michigamme Lake
WAKEFIELD
BESSEMER
ASHLAND
IRONWOOD
PICTURED ROCKS
MARQUETTE
NEWBERRY
SAULT STE. MARIE
Both of them
MUNISING
SHEPHERD
Virgin Timber
Deer watching Golfer
Manistique Lakes
Falls of the Tahquamenon
TROUT LAKE
CRYSTAL FALLS
IRON RIVER
IRON MOUNTAIN
Indian Lake
Auto Camping
ESCANABA
MANISTIQUE
EASTBOUND ORE BOATS
Sugar Beets
MENOMINEE
CHEBOYGAN
HARBOR SPRINGS
PETOSKEY
CHARLEVOIX
Mullet Lake
Burt Lake
Beaver at work on dam
ROGERS Limestone
BOYNE CITY
ALPENA Cement
CLEARWATER
Grand Traverse Bay
GAYLORD
Driving Logs
HARRISVILLE
TRAVERSE CITY
GRAYLING
Au Sable
GREENBUSH
OSCODA
FRANKFORT
ROSCOMMON
Manistee R.
Houghton Lake
Duck
IAWASEE
WEST BRANCH
MANISTEE
Shingles
GLADILLAC
STANDISH
Delightful Riding
LUDINGTON
GLADWIN
Cows
Beans
BAY PORT
MIDLAND (DOW)
BAD AXE
Peaches
BIG RAPIDS
SEBEWAING
WHITEHALL
BAY CITY
Muskegon River
MT. PLEASANT
Apples
SAGINAW
Clover
LEXINGTON
MUSKEGON
GRAND HAVEN
Grand R.
IONIA
FLINT
OWOSSO
PORT HURON
ST CLAIR
GRAND RAPIDS Furniture
MILWAUKEE
HOLLAND
Celery
PONTIAC
MT CLEMENS
LANSING
SAUGATUCK
WISCONSIN
ILLINOIS
SOUTH HAVEN
KALAMAZOO
BATTLE CREEK Sanitarium Foods
DETROIT
JACKSON
ANN ARBOR
WATERVLIET
BENTON HARBOR
Kalamazoo R.
Ford
ST JOSEPH
St. Joseph R.
Golf
CHICAGO
Corn
Sand dunes
Dairying
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Michigan Tourist and Resort Association, 106 Federal Sq. Bldg., Grand Rapids.
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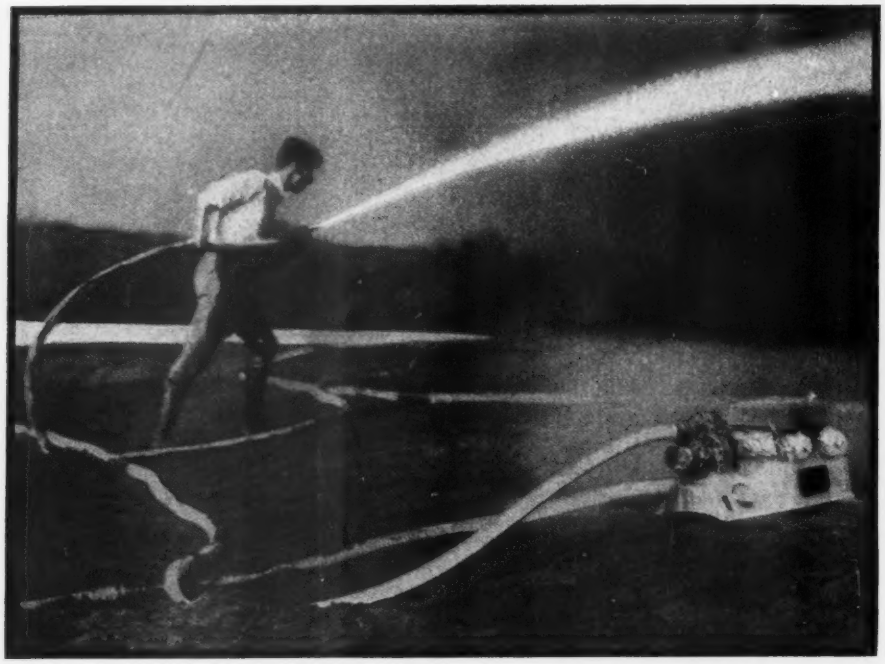
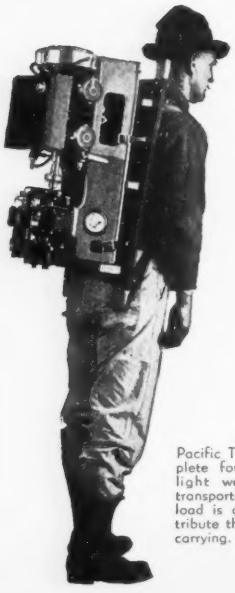


PACIFIC PUMPERS



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